TECH.

PUBLIC LIBRARY
MAY 6 - 1938
DETROIT

NATIONAL PETROLEUM NEWS

REFINING TECHNOLOGY EDITION

Richfield's $5,000,000 Program
PAGE R-212

Motorists Lose $65,000,000
PAGE R-217

Combination Crackers Pay Off
PAGE R-203

Properties and Lube Performance
PAGE R-224

Drop Sale of Third Grade
PAGE 38

MAY 4, 1938

'36 EXPO "GAS" TAX CONSCIOUS

Prominent among the displays at the last International Petroleum Exposition in the spring of 1936 was that of the American Petroleum Industries Committee showing graphically the tax load a tank of crude carried, the gasoline in a tank truck and so on.

It Loads Right

THE ACCURATE, DEPENDABLE SERVICE LOADING VALVE

The most important bulk plant appliance is the valve which loads the truck tanks. The Morrison Fig. 119 is just that kind of valve.

It is slow closing but not too slow. It is always safe, sure and reliable.

The slow closing mechanism takes the jar and pound from overworked lines. It gives absolute protection for meter equipment. The valve is also made with adjustable closing features.

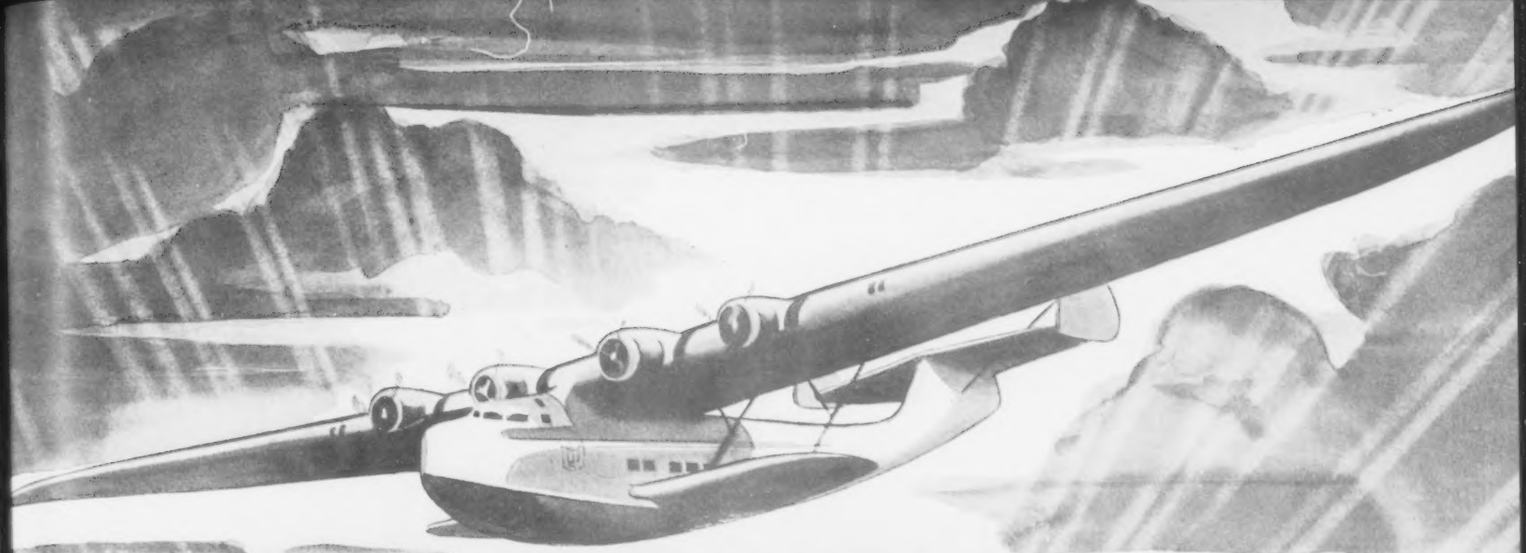
It is the ideal valve for pump loading.

Write for folder and prices.

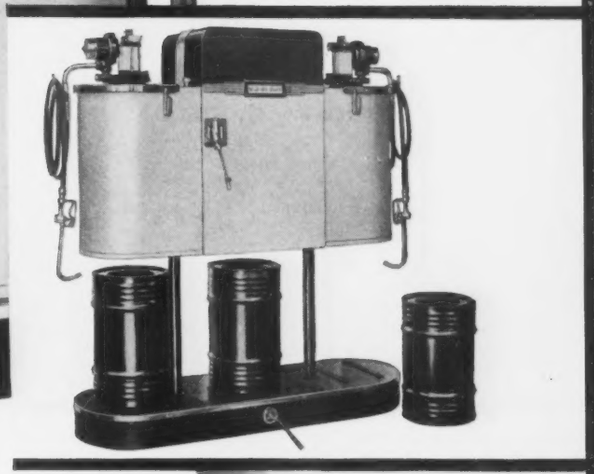
MORRISON BROS. COMPANY

OIL EQUIPMENT HEADQUARTERS

DUBUQUE, IOWA



U. S. AIR LINER



U. S. Air Liner has that "individuality" which not only attracts and sells a customer but renders a lubrication job never before equalled by any other piece of lubricating equipment. It really does a masterful job of lubricating as well as a thorough job of selling. ◆ It has beauty combined with "mechanical brains" because it operates entirely by air and the operator's work consists mostly of "finger work" on the controls. Mechanically you can forget there is any mechanism because the remarkable new U. S. (patent applied for) pump is absolutely "trouble-free" and actually improves with use. ◆ Changing grease drums is a fast, easy and simple operation. You merely insert air hose in the base and up pops the entire cabinet and remains elevated while changing grease drums. This is a Special Patented U. S. Feature. ◆ Like all great performers, the U. S. Air Liner has beauty . . . speed . . . practicability . . . durability and a "built-in goodness" that goes deep down under. Moderately priced.

THE UNITED STATES AIR COMPRESSOR CO.

CLEVELAND, OHIO, U. S. A.

CAR WASHING SYSTEMS
AIR COMPRESSORS

AIR TOWERS

GREASING EQUIPMENT
HYDRAULIC LIFTS

Head of Tulsa Oil Exposition Since 1927

Much of the credit for building the International Petroleum Exposition at Tulsa into what is said to be the largest exhibit put on by one industry in the world goes to W. G. Skelly, head of the Skelly Oil Co., Tulsa, who has been president of the Expo since 1927.

By that year the Expo had moved to its own site east of the city, had dropped the carnival features that had marred the earlier expositions for exhibitors and was recognized as a permanent feature of Tulsa. That year there were 189 exhibitors and attendance was close to 68,000.

Under good business management the oil show expanded in the years following, the 1936 Expo drawing over 150,000 attendance to see the displays of 377 exhibitors. The Expo has paid for its grounds and is financially independent. Attendance of 200,000 is expected at the 1938 show, May 14-21.

News By Teletype From 4 News Bureaus

National Petroleum News

News From Oil Industry Everywhere

VOLUME 30 WEDNESDAY, MAY 4, 1938 NUMBER 18

Chemurgy Aims At Alky Plants For Farm Belt

By M. G. VAN VOORHIS

OMAHA, April 30.—It was announced at the Fourth Annual Chemurgic Conference here this week that the Chemical Foundation, early backer of the program to make alcohol from farm produce to blend with gasoline for motor fuel, had withdrawn further support from the National Farm Chemurgic Council.

The future program of the Council for the development of power alcohol, as far as could be observed from the meetings here this week, is to promote alcohol plants through local Chambers of Commerce in towns in the Middle West farming territory. Many delegates from these towns attended the conference to catch the contagion being spread at Atchison, Kans., and Sioux City, Ia.

Among the 550 attending the Farm Chemurgic Conference here were a larger number of farmers and business men than at earlier meetings. The atmosphere of the booster Chamber of Commerce meeting was prevalent, in the badges and in the back slapping among the visitors.

Great to-do was made about the alcohol plant proposed for Sioux City, Ia., which was first promoted last winter, and off hand references implied that a plant there would soon be operating. As a matter of fact, no plant has been started there yet. Cedar Rapids is now in the throes of the next push for an alcohol plant and many delegates from its business men were at Omaha, to be exposed to the enthusiasm of those back-

(Continued on page 18)

Rival Gasoline Bank Nights Dazzling Motorists In Ohio

N. P. N. News Bureau

CLEVELAND, May 3. — The crest of a gasoline bank night wave today had rolled through some 40 counties in northern Ohio, where a rival oil company's Service Station Sweepstakes strove to outdo the Lucky License Award of the Hickok Oil Corp. and affiliates, which started here three weeks ago.

Outside of large areas in Michigan, Wisconsin, Ohio, and Iowa, the introduction of the theatres' bank night as the newest in gasoline premiums has been sporadic, according to a survey by NATIONAL PETROLEUM NEWS.

In such widely scattered points as Virginia and Ann Arbor, Mich., gasoline bank nights have been prevented or stopped because of threatened prosecution by authorities under the lottery laws.

In northern Ohio, motorists were offered a chance to win as much as $5000 for just writing their license numbers on coupons and dropping the slips in boxes at the stations, were enjoying a Roman holiday. Sweepstakes promoters here reported dealers were running out of coupon books faster than they could be supplied.

In Toledo dealers were not waiting for the promoters to come around, but drove to distributing center to get their banners and coupon books and information on the plan.

Prosecutor Faces Court

In Detroit, where an oil man will slap an injunction on anybody at the drop of a hat, the Highland Oil Co., distributors of Hickok's Hi-Speed gasoline, sought to steal a jump on the authorities. It applied for a restraining order against the Wayne County prosecutor, enjoining him from "threatened wholesale prosecutions," in con-

(Continued on page 11)

Jobbers Check Trucks And Plants, Aided By N. P. N. Inspection Forms

By JOHN W. THOMPSON

N. P. N. News Bureau

CLEVELAND, May 2.—Independent jobbers are making practical use of the bulk plant and truck inspection forms carried in the April 27th Bulk Plant and Truck Inspection Number of NATIONAL PETROLEUM NEWS, as one part of its 1938 spring rehabilitation program for marketing companies, to allow them to better meet today's competition.

Although this issue has been in readers' hands only a few days, there are many indications that the forms published in it for self inspection of bulk plant properties and equipment and trucks are being put into service by jobbers.

Also, scores of jobbers over the country have reported they have given careful study to the analysis of bulk plant, truck and service station operating costs which have appeared in recent issues of NPN. Many have used the NPN Minimum Profit Standards for bulk plants, trucks, service stations and for service station cleanliness which have been developed and offered to the industry in tentative form as another part of its editorial program.

At Fostoria, Ohio, an independent jobber, L. H. Alexander, of the Seneca Oil Co. states:

"Your NPN Inspection Form for bulk plants, as published in your April 27 issue, is a 'masterpiece', and it would be very difficult to find just one bulk plant in the entire industry that could not find improvements that can be made, if carefully checked by this Inspection Form. You are on the right

(Continued on page 17)

SERVICE STATION INSPECTION ISSUE —JUNE 1

The Service Station Inspection Issue of National Petroleum News, including complete forms for station inspection, will be published June 1, instead of May 11 as previously announced.

Pipelines Slice Buying of Crude In Mid-Continent

By Teletype
N. P. N. News Bureau

By LAWRENCE E. SMITH

TULSA, May 3. — The Oklahoma and Kansas regulatory commissions are still trying to find the solution to the pipeline proration situation in the two states and have deferred action on May allowable production orders until the end of this week. The Oklahoma Commission will hold a hearing May 5 and the Kansas Commission will meet May 6. In each case this is the second try at it.

In both states crude purchasers have put in their own percentages of purchase substantially lower than the allowable production as set by the state commissions. In Oklahoma another company that announced reduced takings over May was Sinclair-Prairie Oil Marketing Co.

It is cutting off more than 8000 barrels daily, chiefly in the Oklahoma City area, including the Edmond and Moore pools. This is the fourth company to go below the official allowables in the state and in Kansas a half dozen companies are doing the same.

This form of restrictiin was extended to the Rodessa field this week when Gulf Oil Corp., put into effect a reduction of one-seventh of the official allowables on properties to which its lines connect. Affected is the Texas end of the Rodessa field, which has been spared heretofore from the Sunday shutdown so as to preserve parity of production with the Louisiana side of the field.

Okla. Buyers Canvassed

In an effort to restore ratable taking, the Oklahoma Corporation Commission held a meeting today with purchasers in Tulsa. Canvass of the buyers present and assuming that those not represented would take the same amount that they

(Continued on page 20)

Truckers Beat Rails, New Law Is Approved

COLUMBIA, S. C., May 2.—South Carolina's restrictive truck law, which threatened to put a crimp in trucking operations in this state, including transportation of petroleum products, has been wiped from the statute books.

Governor Olin Johnston has signed the new truck bill, liberalizing size and weight restrictions. Johnston's approval came as somewhat of a surprise as last year he vetoed a similar bill repealing the state's 20,000-pound maximum weight limit.

The new law raises the weight limit to 40,000 pounds and lifts the maximum width from 90 inches to 96 inches.

The governor's action is considered as an outstanding victory for truck operators and shippers, who waged a lengthy fight against railroad lobbies to have the bill enacted. The new law brings this state's truck law in line with those of virtually all other states in this part of the United States.

The victory takes on added significance when it is remembered that the U. S. Supreme Court ruled South Carolina's 20,000-pound, 90-inch width law was constitutional and that it did not impose an unreasonable burden on interstate commerce.

The South Carolina case attracted nation-wide attention because it was viewed as a test case, and it enlisted the support of the American Trucking Associations, Inc., and other trucking bodies.

Only three states remain—Tennessee, Kentucky, and Texas—with truck limits considered below reasonable levels by the trucking organizations.

Rails Battle Desperately

Last Friday night, April 29, was the governor's "deadline" for signing the bill to make it take effect. Last Thursday railway opponents, who had waged a strenuous opposition to the measure, held what they termed a meeting of a "safety council" in opposition, with a march of about 2000 women and children—said to be chiefly the wives and children of railway employes—to the capitol.

This was reminiscent of the march several weeks ago of some 2500 truckers, farmers, petroleum dealers and others demanding the action of the legislature on the measure.

Friday afternoon, April 29, Gov. Johnston asked for a hearing of opponents and proponents. Fifteen witnesses, including farmers, truck owners and truck shippers, appeared in behalf of the measure, and only five witnesses, including M. V. Horne, state legislature member who filibustered almost 24 hours against the bill, appeared against it. Horne is a yardmaster for the Southern Railway.

It was only about six or seven hours after his own private "hearing" that Johnston signed the bill.

A potent weapon for the bill was the half-page advertisement placed in the Columbia newspapers by the Motor Transportation Association of South Carolina, Inc., pointing out that trucks, which carried only four per cent of the total tonnage moved in this state, paid $3,541,393 in taxes during 1936, compared with railroad tax payments of $3,162,620.

The new law, which provides for 40,000 pound maximum weight and 96 inch maximum width, also contains a provision that vehicles must be able to make 20 miles per hour on a 5 per cent grade. However, enforcement of this "performance factor" is not expected to be rigid.

The new law, according to its proponents, will bar some of the dilapidated equipment now operating from the highways, since non-enforcement of the 20,000 pound law has allowed almost anything to operate as a truck carrier. It also contains regulations as to head, tail and clearance lights, adequate brakes, 12.5 foot maximum height, and gives the Highway Department authority to restrict gross weights to less than 40,000 pounds "where highways are not sufficient" to support these loads.

Gillette Bill Opinion Refused By Cummings

By Teletype
N. P. N. News Bureau

WASHINGTON, May 3. — Adhering to its established policy, the Department of Justice has declined to give an advisory opinion on constitutionality of the Gillette-Biermann bills to divorce marketing of petroleum products from the other branches of the industry, it was learned today.

The opinion was asked by Senator Pat McCarran, (Nevada) chairman of the judiciary sub-committee which held hearings on the proposal last month.

Truckers Hail Victory

N. P. N. News Bureau

WASHINGTON, May 2.—Enactment of South Carolina's new truck, liberalizing size and weight restrictions, "opens the entire Atlantic seaboard to truck traffic, removing a barrier which interfered with the free flow of interstate commerce," the American Trucking Assns., Inc., declared today in hailing approval of the new law.

In his reply, Attorney General Cummings said the bill involves a "matter of legislative policy" upon which the department does not desire to rule.

Meanwhile, the record of the four day hearings has gone to the Government Printing Office to be printed. No action is expected from the sub-committee until after the record is printed.

California Dealers Wage Fight on Discounts

N. P. N. News Bureau

LOS ANGELES, April 30.—Maintenance of retail prices on California branded gasoline, nominated by marketing companies, appeared four steps nearer success the past week when the Retail Petroleum Dealers Ass'n launched a second mass-attack against price cutting service station operators in the Los Angeles Basin.

Similar in most respects—even as to the brand of gasoline sold—to the initial move a week ago, the new complaint charges violation of the California Fair Trade Act by four station operators in the city of Long Beach and asks injunctive relief and damages.

Specifically, it is claimed on behalf of Ray F. Boyd, a station operator in this area handling products of Signal Oil Co., that the four defendants and a number of John Does, also handling products of this supplier, sold a branded motor fuel "Signal gasoline" at less than the retail price nominated by the supplier.

As in the previous case, it is charged the defendants were informed on numerous occasions that Signal Oil Co. had entered into standard contracts providing for price nomination. Notwithstanding this, however, they continued to cut prices by means of secret rebates, allowances, refunds and prizes.

A hearing on the original blanket suit was scheduled for April 29th but was postponed until May 4th.

Ethyl Case Trial Is Delayed Again

N. P. N. News Bureau

WASHINGTON, May 2.—Another postponement of the government's anti-trust suit against the Ethyl Gasoline Corp., an equity proceeding originally set for trial in the U. S. court for the southern district of New York late in April, leaves the question of when it will be brought to trial still indefinite.

Just before the April trial date, the government announced a postponement, saying the case was expected to come up this week, but now justice department spokesmen say it will not be tried at least until after May 15, and possibly not until after June 1.

If trial begins between May 15 and June 1, it was said at the department, Judge H. W. Goddard is expected to hear it; after June 1, it will be Judge J. William Bondy, they added. Judge John C. Knox, originally scheduled to hear the case, has been re-assigned, it was learned.

Both sides have agreed to a stipulation of facts on which the trial will be based, it was understood. Arguments will be confined to matters of law.

ICC Awaits Application On Rate Differentials

By Teletype
N. P. N. News Bureau

WASHINGTON. May 3. — Interstate Commerce Commission officials said today they are still awaiting application of western railways for authority to restore the so-called "Group 3" differentials for shipment of petroleum products from producing districts.

Traffic managers of western railroads agreed almost two weeks ago (NPN, April 27, page 18) to restore the differentials, in cents per hundred weight, which was disrupted by the 10 per cent freight rate increase granted by ICC several weeks ago.

Road Fund Bill Pushed

By Teletype
N. P. N. News Bureau

WASHINGTON, May 3. — House Rules Committee today granted a rule for consideration of the Cartwright bill, making federal-aid highways authorizations for fiscal years 1940 and 1941 at same rate as current year's appropriations. The bill is expected to come up for House consideration late this week or early next.

620,000 Barrels Daily Is Goal Of Calif. Producers

BULLETIN

LOS ANGELES, May 2.—California crude oil output April 30 was 701,996 barrels. The average for all fields in the state during April was 717,792 barrels.

N. P. N. News Bureau

LOS ANGELES, April 30. — With the open threat of a drastic cut in crude prices growing stronger every day, California oil producers have adopted new tactics in coping with the current overproduction problem and have set their sights on a proration goal scheduled to lop nearly 100,000 barrels a day off the state's oil output.

At a meeting held by the Central Committee of California Oil Producers in Los Angeles April 26, the May daily production quota for all fields in the state was set far below recommendations of crude demand for May for this territory by the U. S. Bureau of Mines.

In discussing ways and means for reducing the state's production to the new quota and to alleviate the existing storage situation, the committee passed another resolution asking for the co-operation of purchasers and refiners in limiting their takings and runs to assigned quotas.

A committee composed of J. R. Pemberton, oil umpire, chairman, Lawrence Vander Leck and W. H. Geis was appointed to call upon purchasing companies with a view to determining their attitude to buying only quota-produced oil.

It was pointed out that this action is in the form of a request from the producers represented by the central committee to the purchasing companies, and is necessary by reason of the large overproduction and is a part of the drastic action being taken.

The committee pointed out that although the Bureau of Mines indicated demand for California crude during May was some 30,000 barrels under the April figure, it was still much higher than warranted by

(*Continued on page* 24)

Toledo Price War Still Rages, Station Closing Threat Fades

TOLEDO, May 3. — Toledo service stations were open here today, despite threats last week from 200 retailers that they would close up if major company suppliers did not lower tank wagon prices to a point where they would have a four-cent margin.

Plans to carry out the threat, which grew out of the current price war, fell through May 2 when a committee of the Independent Petroleum Dealers Assn. met to devise a way of easing the tension in the current controversy, according to Otto Linker, dealer president, who said no plan is under consideration at present. "We are right back where we were two weeks ago", he added.

During the price war, now in its seventh week, the prevailing posted retail price on regular grade gasoline has dropped 2 cents to 16.5 cents, while tank wagon prices at first went down only one cent which, in effect, cut dealer margins to 2.5 cents, station operators complained.

On April 28, Standard of Ohio cut its tank wagon price 0.5 cent, increasing to 3 cents the spread between its tank wagon price and retail prices at Sohio company-operated stations.

The 200 station operators had originally given the major oil companies until noon of May 2 to agree to their demand for a wider margin, but this did not jell and a special retailers' committee meeting was called for the evening of May 2, the outcome of which was also fruitless, according to Linker.

A mass meeting of Toledo retailers was to be held the evening of May 3 to discuss further plans for breaking the price war deadlock.

Expo Marketers' Day is 18th

CLEVELAND, May 2. — In the tentative program for the International Petroleum Exposition at Tulsa May 14-21, as published on page 30 of this issue, the date of Marketers' Day is incorrectly given as May 19th. The Expo officials wish to announce that Marketers' day is May 18th, as originally announced.

Rival Gasoline Bank Nights Dazzling Motorists in Ohio

(*Continued from page* 9)

nection with its lucky license scheme.

The Wayne County Circuit Court thereupon entered an order requiring Wayne County Prosecutor Duncan C. McCrea to show cause why the restraining order should not be granted.

Bursting with what he admitted was considerable indignation at the turn of events, Prosecutor McCrea appeared April 30 before Circuit Judge Vincent Brennan and said he never heard of such a thing as a court trying to stop an officer of the law from enforcing the state gambling and lottery laws.

Judge Brennan said that the prosecutor had a point there and asked the plaintiff Highland Oil Co. to file a brief later this week on why the court should restrain the prosecutor from dusting off the gambling laws.

There is some ground for Prosecutor McCrea's harassed mental state, as gasoline marketers in Detroit, not content with putting on a bank night, opened up yesterday with a brand new price war.

As this price war brought out signs advertising gasoline at three cents off, Secretary Rankin P. Peck of the Retail Gasoline Dealers Assn. of Michigan, said he would ask Prosecutor McCrea to issue warrants against major oil companies allegedly selling at discriminatory prices, and thus encouraging the favored dealers to cut prices.

McCrea protested yesterday that the two assistant prosecutors he had had on oil company cases were now tied up prosecuting a school for beauty operators. The attorney for the beauty school, McCrea said, had fenced around for three weeks and he didn't know when he was going to get his assistants back on the oil cases.

Buck Passing

In Cleveland threatened legal opposition to the Lucky License Award and its rival, Service Station Sweepstakes, apparently had degenerated into buck-passing between the Cleveland Better Business Bureau and the Cuyahoga County (greater Cleveland) prosecutor's office.

William M. Farrar, chief of the Better Business Bureau, called upon the Pocahontas Oil Corp. and Goodwill Merchandisers, Inc., which is running the Service Station Sweepstakes in northern Ohio, to stop giving away from $200 to $1000 to motorists in the name of the gambling and lottery laws of the State of Ohio and the City of Cleveland and for good measure—in the interests of good business ethics.

Goodwill said the Sweepstakes was purely a defensive measure and they would quit if Hi-Speed (Pocahontas nad Hickok) quit, but Pocahontas' president, W. E. Minshall, who is an attorney, said his Lucky License plan wasn't a lottery and, even so, the set-up was such that Pocahontas didn't actually run the Lucky License Award.

Attorney James L. Lind of the Better Business Bureau turned over to the prosecutor the paraphernalia distributed to dealers by Pocahontas and Goodwill Merchandisers, Inc., and quoted to Prosecutor Gerard Pilliod his duty in re Section 2985 of the Cleveland Municipal Code and Section 13064 of the Ohio Code of 1934, all of which doesn't permit lotteries. He said it would be up to the prosecutor to have police make the actual "buy" and make the arrests.

First Assistant Prosecutor Sidney B. Fink, however, said that his office would be very glad to "try and make a case" if anybody complained, but would not ask police officers to enter the contest and otherwise conduct a crusade against the gasoline bank nights.

At Ann Arbor, Mich., Washtenaw County Prosecutor Albert J. Rapp rummaged through his statute books, and unearthed a law which is pretty long and complicated, but is to the effect that the State of Michigan won't tolerate lotteries. The Hi-Speed stations in Washtenaw County have taken the Lucky License signs down, it was said.

Paid for Walking

A good deal of legal hair-splitting has been perpetrated in an effort to determine whether or not the gasoline license awards are lotteries and thus in violation of the law. Lind said that the three elements of a lottery were a prize, a chance, and a consideration. Everybody agrees that the first two elements are present, he said, but the difference of opinion comes on what constitutes "consideration".

Even though the motorist does not make a purchase to enter the contest, the fact that he walks a number of feet to obtain an entry blank is a consideration, Lind said. He said that an Ohio court had ruled that a customer walking 76 feet

to deposit a stub in a ballot box made an offering by a Cincinnati (O.) restaurant a lottery.

Meanwhile, with all this talk going on, Ohio was the stamping ground for a Lucky License vs. Sweepstakes rodeo. Hi-Speed stations were hardly into the second week of their contest here when Standard Oil Co. (Ohio) decided such gallonage-getting schemes weren't Hoyle in its territory. Thus appeared the Service Station Sweepstakes of Goodwill Merchandisers, Inc., a pseudonymous designation for Hallas-Kumler of Chicago, promoters extraordinary, as explained by John M. Kumler, whose name is part of the firm.

Within seven days the Service Station Sweepstakes had appeared at almost every station—not only Standard stations—in the 40 counties of northern Ohio, except, of course, at Hi-Speed stations.

A. A. Stambaugh, vice president of the Standard Oil Co. (Ohio), said that the Service Station Sweepstakes was entirely the plan of Sohio without any assistance from other oil companies. The installation of the Sweepstakes plan in all stations except Hi-Speed outlets in addition to Standard stations was presumably for effectiveness of the fight-fire-with-fire campaign.

The Sweepstakes coupon books anticipate an end to the bank night war with the sentence, "This plan is subject to cancellation at the end of any weekly award. In event of cancellation of weekly awards, however, the grand prize of $5000 will be paid."

Here's How

Under the plan used by Hi-Speed stations, the motorist drives into any Hi-Speed station and obtains a card from the attendant. The attendant simply writes the motorist's license number on the card and punches it for the current week. This entitles the motorist to a chance on the current week's award. The Hi-Speed company at the close of the week picks at random a license number from the state automobile license registration list for the counties in which it operates. The number picked is the lucky winner. Should the owner of that number not have registered with Hi-Speed, the $200 prize is cumulative on next week's prize, which then becomes $400.

The winning number is posted at all Hi-Speed stations in the territory and the owner of the license must put in an appearance at any station within 24 hours, to secure his money.

Participating motorists must have their cards repunched every week, thus bringing them into the service stations once every seven days in the hope, of course, as far as the oil company is concerned that they will be courteous and buy gasoline while having their cards punched.

The Service Station Sweepstakes differs only in details. A motorist must enter a station, tear off from a coupon book the coupon dated for the current week, write his license number on the coupon and deposit it in a slotted box.

These coupons are then collected from all the stations in Ohio once a week and deposited in a barrel . . . if a big enough barrel can be found. The winning number will be drawn from this pot. The first Sweepstakes drawing here will be posted May 9.

Jobbers Are Opposed To Station 'Drawings'

N. P. N. News Bureau

CLEVELAND, May 3. — Approximately 15 jobbers in Wisconsin are using the Lucky License award, gasoline version of the theatre bank nights, according to Roy F. Brecke of Milwaukee, secretary of the Wisconsin Petroleum Assn.

One of these, he said, received instructions from the district attorney of Waukesha county to discontinue the practice, and it has been carried to court as a friendly test case. The case is now pending at Waukesha.

"At our annual convention we passed a resolution against the Lucky License, premiums, trading stamps, and the like," Brecke continued, "although most of the members on the resolutions committee had Lucky License themselves. But they were in favor of abolishing them provided all abuses were done away with, including trading stamps, free oil, the giving away of two cars a week and offering of cash prizes."

The Wisconsin Petroleum News, organ of the Wisconsin Petroleum Association, printed an editorial which said in part:

Classed As Abuses

"Right along the same line for making inane creatures out of men in the industry are the Lucky License, bank night, trading stamps, free oil, automobiles, cash prizes, and other give-away schemes now employed to donate to foxy John Customer about five times more than he deserves for his money.

"They slash the jobber's and the retailer's profits down to nothing and put all their rightful profits into the consumer's pocketbook. We believe in stopping all these costly abuses, and not prohibit one group of jobbers from using one form of abuse and let the rest get by. What's fair to one is fair to the other.

"But, after all, IF the petroleum jobbers in the state are in business for everyone but themselves; IF they want to lop off their noses to spite their faces and IF they want to be the laughing stock of the business world, let them continue to have price wars, trading stamps, bank nights, free automobiles, cash prizes and lucky license schemes. They're lots of fun."

Representatives of the Ohio Petroleum Marketers Assn. have interviewed the staff of the Ohio attorney general with a view to becoming better informed on the lottery and gambling laws which may cover Lucky License and Sweepstakes awards, Robert A. Warfel of Columbus, O., executive secretary, said.

"In talking to the companies sponsoring the lucky pay off," commented A. C. Gienapp of Manchester, Iowa, secretary of the Iowa Independent Oil Jobbers Assn., "almost in every instance they state they were forced to it by canopy rebating and discounting of competitors, and are protecting their own gallonage."

"Too many of the operators are volume rather than profit-minded," he continued, "not realizing these practices cause others to do likewise and the whole market becomes demor-

(*Continued on page 24*)

Virginia Jobber Loses Fight On Tank Truck Inspection Fee

LYNCHBURG, Va., May 2.—Hopes for a further amendment to the Lynchburg city ordinance imposing an inspection fee on all gasoline entering the city for distribution were expressed here today by officials of the Lynchburg Oil Co., following a "test case" on the ordinance last week. (NPN, April 20, p. 16)

Municipal Judge Joseph P. McCarron upheld the ordinance, but ruled that transport trucks hauling the company's supplies from Richmond did not come under the ordinance so long as they dumped their loads at the company's bulk storage located outside the city limits.

Although the ordinance originally provided a flat inspection fee of $5 per compartment, this has been modified by administrative ruling recently so that, as applied to tank trucks, the fee is $2.50 for each kind or grade of gasoline carried. Thus, if the load of a transport truck hauling only one kind of gasoline was inspected, it paid only the $2.50 fee, but if it had two grades aboard, the $5 fee was exacted.

It was not payment of the inspection fee so much as the delay incident to the inspection which was attacked by the Lynchburg company in the test case, its officials explained. The ordinance provides that a tank car or truck may not be unloaded until after a sample has been taken and inspected.

However, it is understood that the city officials, loath to lose a source of revenue which last year produced $3600, have expressed willingness to co-operate with the Lynchburg company, which also has storage inside the city limits, and others using trucks to bring in their supplies in amending the law so that it will not work a hardship on them—either in excessive fees or loss of time—rather than have the case taken to a higher court and possibly have the ordinance outlawed.

It is said some city officials have tentatively agreed to an amendment which, instead of levying a "per compartment" fee, and requiring inspection of each shipment, would make the city tests at random at bulk plants located inside the city limits, after delivery, basing the inspection charge on a gallonage basis.

Under the present set-up, inspection of a truck-load sometimes requires as much as a half-day, depending upon how much time inspectors have to make the trip to the point where cars or trucks are spotted. This causes time of both trucks and drivers to be lost, it was pointed out.

Several other oil companies here have joined in the protest of the Lynchburg Co., some of them claiming that the inspection fee, even at $2.50 per truck, is unreasonably high. The $5 inspection fee, applied to a 10,000 gallon tank car, however, amounts only to .05 cents a gallon.

Business Upturn Will Come In Fall, W. P. R. A. Told

HOT SPRINGS, Ark., April 28. — The Western Petroleum Refiners Assn. initiated a different type of business sessions program for its 26th annual convention which closed here April 27.

Instead of having speakers within the petroleum industry discuss conditions in their own field, the association had a number of nationally known business men and economists discuss conditions in all industry. The speakers were B. C. Forbes, editor and publisher of "Forbes Magazine"; Glenn Griswold, vice president of McGraw-Hill Publishing Co. and editor of "Business Week"; Whiting Williams, industrial relations counsel and writer; James R. Adams, nationally known automobile advertising agency executive, and Harvey T. Harrison, well known Arkansas attorney.

Editors Forbes and Griswold apparently see eye to eye on the immediate past and the near future in both business and legislative trends.

Forbes said the present depression has been the sharpest and the most severe in the history of the nation — but he thinks things will be better after next November and that elections will be favorable to business men. He believes, judging from the tone of the letters he receives, that public opinion is returning to sanity. He also doubts that the administration at Washington will now attempt to drag into court any more cases like the Madison oil conspiracy trial, which he termed "infamous."

Public opinion, Forbes said, is moving toward sound economics, and "I don't think that again there will be any such monstrous actions from Washington, as there have been in the recent past."

Editor Griswold referred to the depression as being, since last Labor Day, the sharpest and most abrupt in America's history.

"We were paying for some of our recent sins," Griswold said, "and the result has been four or five months of terrible reaction without any cause except fear. We wouldn't have to worry if confidence was restored generally in this country. The fear turns on fear of the present administration in Washington. This very situation may have a solution. . . the only thing that will give confidence and energy is assurance it doesn't make any difference what attitude business takes toward the administration . . . the hope and the best effort is in freezing the experiment where it is."

Upturn In Fall

Griswold then said that factors are shaping up now to the point that by next Labor Day he believes business will be on the way upward, without the fact that an election is coming on."

Discussing labor, Editor Griswold said that the country had been in the position of developing a Labor Party, but that threat definitely is gone. He said that John L. Lewis is "short circuiting" the White House and sitting down with the "60 families" and working out something lasting.

"When big business might have licked labor," Griswold concluded, "it is significant that it is trying to work out labor relationships without government interference. There have been conferences recently in the east attended by individuals whose names would surprise you."

Touching briefly on the oil industry Griswold said that it seemed to him that the industry needed to give attention to public relations, and warned that there was a tendency in some quarters toward making a public utility out of the oil industry.

Adams in his talk on "Emphasis on Marketing" also stressed the need of better public relations work in the oil industry. He said he doubted if anywhere prejudices in brand names are as high as in the oil business.

"You have to talk in terms of what you have to offer," Adams stressed, instead of the product itself. You have to tell the public about your industry. I would like to see your industry take recognizance of that fact and establish a national association for that purpose."

Roy B. Jones, president of the Panhandle Refining Co., and chairman of the meeting, said at the conclusion of Adams' talk that a plan already was afoot along the lines the speaker had suggested but that it had not been announced generally as yet.

Labor Situation

Williams touched more thoroughly on the labor situation than did Griswold, yet he stressed the point that fear also was ruling the worker nowadays. The fear, he said, was that of losing his job. "We have been taking the labor leader more seriously and the worker less seriously than needed," Williams said. Most of the demands in labor troubles, he pointed out, are not founded on issues but on the feeling of injustices by the management to some of the employes.

He said there were more hopeful signs now, one of them being that the worker is beginning to believe the solution is more work instead of continued offer of palliatives. He closed with the suggestion that employers keep in mind the simple causes of the labor problem, and to keep closer contact with the employes.

Mr. Harrison's talk was a humorous discourse on the recent legislative trends. He said that, "You cannot legislate prosperity into existence, but you can legislate it out of existence."

W. P. R. A. Honors Boggs

HOT SPRINGS, Ark., April 28. — President C. M. Boggs, who was signally honored by being the first president to be elected to a fourth term as head of the Western Petroleum Refiners Assn., had long admired two oil paintings that hung in an art gallery in Kansas City. He and Mrs. Boggs had often talked of how well the two paintings of country life would look on the walls of their farm home near Arkansas City, Kan.

At the final business session of the association here April 27, a committee representing the board of directors brought the two paintings in to the luncheon room and presented them to Mr. and Mrs. Boggs on behalf of the association.

Boggs and Other Officers Are Re-elected By W. P. R. A.

HOT SPRINGS, Ark., April 28. — Clyde M. Boggs, president of Kanotex Refining Co., Arkansas City, Kan., the oldest refining company in the Mid-Continent, was re-elected president of the Western Petroleum Refiners Assn. for a fourth term when the board of directors met here April 27.

The board also re-elected all officers as follows:

Executive vice president—H. T. Ashton, Socony-Vacuum Oil Corp., (Lubrite division) St. Louis.

Vice Presidents — Roy B. Jones, Panhandle Refining Co., Wichita Falls, Tex.; T. M. Martin, Lion Oil Refining Co., El Dorado, Ark.; and R. W. McDowell, Mid-Continent Petroleum Corp., Tulsa.

A. V. Bourque was renamed secretary and treasurer and Mary Sue Collins, assistant treasurer.

The executive committee, also re-elected, is composed of Messrs. Boggs, Ashton, Jones, McDowell, Martin (of Lion Oil), Henderson, Clark, Simmons, Kennedy and O'Shaughnessy.

The membership adopted a resolution extending congratulations to Emby Kaye, who has been chairman of the manufacturing committee, for the excellent technical programs that have been held under his leadership. Another resolution thanked the equipment manufacturers for the "Bubble Tower", which was operated in connection with the annual dinner-dance.

A resolution also was adopted calling for the association to undertake the writing and adoption of a uniform inspection code for refineries.

A committee appointed three years ago for the study of methods of posting tank car prices was disbanded after Secretary A. V. Bourque pointed out the fact that the committee made a report two years ago that no recommendations had been reached, and that the committee had not held a meeting since that time. Some interest had been shown in the plan prior to the convention this year, he said, but the committee failed to meet.

President Boggs in his annual address referred to meetings of independent refiners seeking to form a sales agency of some sort. These refiners met April 24 and named Rex H. Winget permanent chairman, but as stated by Mr. Boggs, further study was recommended before any attempt was made to perfect an organization patterned after Appalachian Coals, Inc.

Maryland Tax Collections Up

By Telegraph

ANNAPOLIS, Md., May 3. — Collections of Maryland's 4-cent gasoline tax during the first quarter of 1938 amounted to $2,273,175 as against $2,149,611 in the same period last year.

National Petroleum News

Copyright 1938 by The National Petroleum Publishing Co.
Trade Mark Registered U. S. Patent Office.

Published every Wednesday by The National Petroleum Publishing Co.

Warren C. Platt, *Editor and Publisher*
V. B. Guthrie, *Managing Editor*

FOUNDED 1909
Member of Audit Bureau of Circulation and Associated Business Papers, Inc.

Publication office: 1213 W. Third Street, Cleveland, O.
Telephone, CHerry 7672 Cable Address, Plattoil, Cleveland

NEWS BUREAUS

New York, 50 W. 50th Street, Telephone, COlumbus 5-1516 and 5-1517.
Chicago, Buckingham Bldg., 59 E. Van Buren Street, Telephone, Harrison 5901-2-3.
Washington, D. C., 1002 National Press Bldg., Telephone, NAtional 0654.
Tulsa, Okla., 904 World Bldg., Telephone, 3-7132.
Los Angeles, 610-A Hillstreet Bldg., 815 South Hill Street, Telephone, VAndike 2845.

Subscription rate $3 per year in United States and Mexico; $4 in Canada; $4.50 Foreign Countries. Current copies 10 cents, except special issues; back copies more than two months old 20 cents per copy.

One Plank in a Platform For a Sounder Oil Industry

Broader tank car markets.

More refiners, including majors, selling in those markets and more jobbers buying in them also.

Both buyers and sellers **Daily** making completed sales for prompt shipment of unbranded products.

Who is Gulled by "Drawing"? Public or "Smart" Oil Man?

By WARREN C. PLATT, Editor

Some people believe that causing the public to think it is getting something for nothing is merchandising. So they use trading stamps, and premiums of various kinds to delude the customer that these are "just thrown in" without extra charge.

All of these have been tried in the oil industry. Each has lived its day or two, each has bought a little increase in gallonage and then, as a brilliant merchandising idea, has petered out and been discarded. But today we have a new one in the oil business, although its whiskers are hoary with age from use in the moving picture business. It is the prize contest similar to "bank nite."

Leave it to some oil man to pick up this idea to "buy" a little gallonage. This scintillating merchandising (?) stunt is now flourishing around Cleveland, because one perfectly reputable oil company thought it saw a chance to pick up some business. The idea was soon met by another big company promoting a scheme for five times as much prize money among its dealers. So in return for driving into a filling station and leaving the license number of one's car, Clevelanders get a chance—even though a very long one—to win $1000 from one company and $5000 from the second each week as long as the brain storm lasts.

But why will otherwise sane and intelligent men pull a stunt of this sort?

"Bank nites" as staged by some movies have been held illegal under anti-lottery laws by courts in many states. In several instances state supreme courts and federal courts have used strong language in condemning this scheme. Only a few weeks ago—April 7—the Post Office Department issued a fraud order against the alleged promoters of a bank night scheme used by some movies.

One would think that the offending oil company would be fearful of the possibility of Post Office Department action against its prize contest?

One also would think the company would fear the possibility of city and state prosecution and all the unfavorable publicity that would result?

Competing oil companies can be expected to take steps to protect their gallonage so that the drawing will only make a riffle on the gasoline business in the long run. But what the industry should ponder is, what is the state of mind that prompts a man to engage in such as this scheme for, at most, but a temporary advantage?

Whoever said it was good merchandising?

If it is good selling, then, boys, line the roads with the pots, kettles and pans, the sofa pillows and blankets, the "extra" quarts of oil, the "six gallons for 95c" and all the trading stamp schemes, and go get the business regardless.

If it is good selling, then we have done our readers great wrong all these years and even deprived ourselves of advertising revenue by refusing to sell space for these cut-throat schemes.

Just give it all away, boys and be "big merchants," while the WPA is still operating and can give you a job, when it is all over.

Jobs from Tax Relief

Jobs can be made only by Business. But Business cannot pay for both relief and taxes. Why doesn't the President remove the tax burden on one industry for one year and see what it would do with the money now taken by taxes, asked the New York MIRROR in its editorial column recently.

The editorial first shows the taxes the steel industry pays and comments on the number of men its tax bill would hire at prevailing wages. Then the MIRROR goes on to comment on Oil as follows:

"If you don't feel so friendly about Steel—which is a sort of "backbone" industry—you might try Oil, which would probably respond more quickly to the miracle of being relieved of a tax load.

"Of course, the biggest burden on the Oil Industry is from State taxes—the 760-million dollars in State taxes collected on Oil last year would have operated the entire U. S. Government in any single year before we went into the War.

"But the Federal Government was no piker; Uncle Sam collected 200-million dollars in taxes from the Oil Industry in 1937.

"The average U. S. motorist used 650 gallons of gasoline last year. The fuel cost him $95—but $35 of that went for taxes.

"That $35 could have bought new tires—helped hire men in the rubber business; or bought new clothes for the Little Woman; or helped pay for a week's trip to the mountains—all the things that help to make real jobs.

"Mr. President, we urge you to think in this direction for a change; NOT how can Government take care of the unemployed; BUT how can Government help Business provide jobs for the jobless?"

Refiners' Plight Laid To Double-Cross at Washington

—"firm in the belief that they were doing what they thought was not only legal but was also the oft-expressed desire of the Administration,"—

There has been and will be much written, probably for years to come, about the Madison anti-trust case, but perhaps nothing will excel in calm but incisive indictment of the Administration, the remarks read by Clyde M. Boggs in his presidential address to the annual meeting of the Western Petroleum Refiners Association at Hot Springs, Ark., last week.

Mr. Boggs was accounting to his members for his stewardship. That responsibility had caused him to take an active part in the turbulent efforts of the oil code; to protect the rights and businesses of those members.

That responsibility had sent him to Washington many times and finally to inform, and then to plead, with the Administration's highest officers that either the price of crude oil had to be reduced or the tank car price of products to his members raised, or else his members could no longer exist and be the competitive force in the oil industry that the Administration, presumably, so much desired. Against his own better judgment President Boggs listened to the pleas of those Washington officials and returned to tell his members to hold on some more, that aid was coming, so it was said.

We hope some day Mr. Boggs, as well as all the other men who had such intimate contact at Washington prior to the period of "the conspiracy," will tell in detail of their relations with those high government officials who promised one thing and then, when the profit of increased employment and prosperity from higher and maintained crude oil prices came their way, turned and did another. In conformity to the requirements of court procedure that story has only been touched upon, but some day Mr. Boggs and the others should tell all of it, then perhaps business men—and other oil men—will not be so anxious to have this particular government, at all events, do something for them.

Mr. Boggs in carrying out his stewardship was indicted and tried, but dismissed on a motion for a directed verdict just before the case went to the jury. His is the first statement outside the court room by any of the defendants who went through the whole trial. We reprint herewith in full his few words about the plight of the small Independent refiner of the west and how this Administration treated him at Washington and at Madison:

"At this time last year the refining industry in the Mid-Continent field had closed a year of slight prosperity, the second one out of a long line of years of heart-rending financial losses to both large and small concerns. In addition the refiners had suffered the loss of many outlets, consumers who had been on their books for a long period of years.

"It is true the year of 1936, with its improved conditions, did not restore these outlets but it did, in a measure, help make back some of the cash losses sustained by the industry in the previous years. When I say that it made back some of the losses I am speaking literally, for a survey of the Mid-Continent refining industry revenue for the two years 1935 and 1936 shows that the industry failed by many million dollars to equal the losses in the year 1934 alone.

"In 1937 there was an improvement. Some of this improvement was due to the betterment of conditions generally throughout the country. More people were employed, wages were higher, more automobiles were purchased and more 'gas' and oil consumed. In addition, the inter-refinery buying which had been mandatory under the code, was continuing.

"It is true that many of the major oil companies and their executives had been indicted for this type of buying, but, firm in the belief that they were doing what they thought was not only legal but was also the oft-expressed desire of the Administration, the buying was going on and every Mid-Continent refiner believed that 1937 would be a good year. This belief was dispelled before many months had elapsed after our meeting (Spring of 1937).

"The first blow fell when the service station price was cut one-half cent at the very start of the big consuming season and the second jolt came with the cessation of inter-refinery buying and the conspiracy trial began at Madison in October, 1937. Then came a depression more devastating even than the terrible one of 1933 and 1934. Perhaps the refiners' loss in 1937 was not as great when expressed in terms of money as in 1934, but, when the outlook for the refining business of the future is considered, then the present depressed conditions of the industry in the Mid-Continent field must be considered as the worst in refining history.

"As usual the small refiner bore the brunt of the fray. Never in his long history have there been such casualties. The list of dead and injured includes the names of every small refiner in the Mid-Continent field. Those who have not already passed on are left with wounds which will in time probably prove fatal. There is not a doctor who holds out any hopes for the patient's ultimate recovery.

"The tragedy of the whole business is that the small refiner is in the position of an innocent bystander. Caught between a price for crude not comparable with the price he receives for his finished product on one hand, and unable to meet the competition of his larger competitor on the other hand, and with most of his business lost to him, and with even hope gone, it is little wonder that he gazes into the future with nothing but despair.

"He does not even have the hope that his government will help him. On the contrary he fears the Administration and rightly so, for he realizes that for what he was commanded to do by this same Administration under the code he was named a co-conspirator in an alleged violation of the laws of his country. He honestly believes the reason he was not tried with the larger companies was not because the government had any interest in his welfare, but rather it was because public opinion might condemn a government which would punish a small man for endeavoring to protect his business existence.

"He remembers reading the fine letters of commendation from high government officials which extoll the efforts of those who carried out the Administration's orders and now knows that, like a sales quotation, they should have read 'subject to change without notice.'

"The small refiners know that the Administration under the code required that larger companies restricted their production and buy surplus gasoline from small refiners. They know the code provided for a fine of $500 each day the code was not observed. They know only too well that the large companies who obeyed the code were convicted therefor and they know the small refiner himself was named as a co-conspirator.

"It is little wonder, therefore, when a responsible officer of his government questions why the small refiner should have any place in business and why he should not be eliminated, that he is dubious of receiving any help at the hands of his government."

Again, we urged, that it is to the best interests not only of the oil industry but of all industry and of the whole American people, that Mr. Boggs and the others who journeyed to Washington and believed, and obeyed, tell all about those conversations.

Mr. Boggs' people listened to this report of his stewardship for the carrying out of which he had stood trial at Madison, where he was finally dismissed, as the government had not produced any evidence against him nor had been able to drag any out of the defense witnesses.

His stewardship was approved and he was unanimously asked to continue it for his fifth term.—W.C.P.

K. S. Adams Is New President Of Phillips Co.

BARTLESVILLE, Okla., May 2.—K. S. Adams took up his duties late last week as president of the Phillips Petroleum Co.

His election as the second president of the Phillips company occurred at the annual meeting April 27 of the board of directors. Adams succeeded Frank Phillips, founder and president of the company since it was organized in 1917.

Phillips requested the board of directors to relieve him of some of his duties and elect another president. He continues as the senior officer of the company and as general manager.

Adams, who has been with the company 18 years, has been executive vice president of Phillips Petroleum Co. for the last six months.

Prior to his election as executive vice president, Adams was treasurer and assistant to the president. He is listed among the board of directors of Phillips.

Adams began his oil career in the company's warehouse and materials department in 1919, served in various capacities in the producing department and the accounting department and was made assistant to Frank Phillips in 1932.

A graduate of the University of Kansas, Adams served in the field artillery during the World War.

Other Changes

Four vacancies on the board were filled by the election of Vice-Presidents C. P. Dimit, A. M. Hughes, F. E. Rice and M. P. Youker, all heads of departments, and three more department heads were elected vice-presidents. They are C. O. Stark, head of land and geological department; A. H. Riney, chief engineer, and R. C. Jopling, director of public relations.

T. V. Stevens was elected assistant treasurer and J. F. Kinslow, assistant secretary.

Fear, government hostility toward business, and confiscatory taxes were cited by Phillips in his annual statement to stockholders as reasons for the present depression.

"Our nation," he said, "has the resources, the money, the credit, the man power and the purchasing power to restore industry and employment to normal. We hope that in the near future our leaders in government will realize that industry must be relieved of its present burdens and restraints, and that they will co-operate with business leaders in an atmosphere of harmony and peace to bring about those assurances necessary to banish fear and restore business confidence," he said.

"A more friendly attitude between government and business would again influence the flow of private capital into business. It would release hoarded money, increase purchasing power, restore employment and reduce government spending. It is the continuous flow of private capital into productive enterprise, rather than spending of public funds, that insures prosperity," he added.

On the Oil Industry

Referring to the plight of refiners, Phillips said in his statement:

"With the consumption of petroleum and its products higher than ever before in the history of the industry it appears unreasonable that refinery prices of gasoline should be below the cost of manufacture. That, however, is our present plight. As a result of low prices, oil companies are retrenching, many proposed expansions have been abandoned, and men have been thrown out of work. Many small refiners have been forced to close their plants.

"This condition has been brought about by the lack of proper regulation of refinery production and marketing practices. The situation could be remedied through co-operation within the industry to eliminate wasteful and unbusinesslike practices. However, effective voluntary co-operation cannot be accomplished for fear of unwarranted prosecution under the obsolete Sherman Anti-Trust Law which was enacted 48 years ago when present economic conditions could not be anticipated."

Tuttle Moved To Chicago

N. P. N. News Bureau

TULSA, May 2.—O. J. Tuttle, sales manager for Empire Refining Co., with headquarters in Tulsa for a number of years, is removing to Chicago where he will spend a good part of his time in the company's Chicago marketing headquarters. The change was effective May 1.

Tuttle's transfer to Chicago was made in order for him to be closer to the center of the company's marketing activities in the middle west. He will spend a portion of his time also in the Tulsa office.

Clean Rest Rooms to be Theme Of S.O. Indiana Newspaper Ads

N. P. N. News Bureau

CHICAGO, May 2.—The importance of clean rest rooms in pulling into stations the $850,000,000 it is estimated will be spent by tourists this year will feature the Standard Oil Co. of Indiana's opening newspaper advertising program this summer.

This company is increasing this season the number of newspapers from 1596 to 1746 in which it will carry its messages on behalf of its dealers, according to Wesley I. Nunn, advertising manager. Total circulation of the daily and weekly papers it will use will be 14,000,000 as compared with 12,000,000 last season.

"More than 12,000,000 autos will go on tour this year, say traffic experts. These tourists will spend approximately $850,000,000 on gasoline, oil, repairs, etc. Set your own quota and cash in on this extra business," exhorts the Indiana Standard in its Advertising Almanac for 1938, which it is placing in the hands of its dealers. The almanac contains the advertisements which will appear in the company's campaign from May 2 through July 11 and gives tips on how dealers may tie in their own sales activities with the company's current advertising.

The first ad to run in May 2nd newspapers, is a montage photo of the head and cap of a Standard dealer, featuring the words, "Standard Service" across the cap. "Famous for clean rest rooms since the early days of motoring, Standard Oil dealers offer still greater Convenience and Protection for Motoring Travelers," reads the copy with this ad.

"Since the early days of motoring, service stations where Standard Oil products were sold have been famous for Extra Services. Especially clean rest rooms! Many thousands of Standard Oil dealers in the Midwest are carrying on this service tradition—making these facilities cleaner and better than ever, this summer."

"Don't break the chain," says the almanac, in its suggestion to the dealer in connection with this ad. "Standard Oil dealers are known by the clean rest rooms they keep. Do your part!"

The second newspaper ad, to run May 9, is a montage photo of a Standard dealer putting out a clean rest room curb sign. "Clean rest rooms everywhere, provided by Standard Oil dealers for the convenience and protection of motoring travelers throughout the Midwest. Plan your stops where you see the familiar sign, Standard Service," reads the copy.

In connection with the appearance of this ad, the almanac asks the dealer to read an excerpt from the article on station rest rooms which appeared in the magazine *Good Housekeeping* in its April issue. The suggestions this article gave for rest room standards are republished.

The third ad in the newspaper series, to run May 16, shows the tourist family leaving the car at the stations with the Clean Rest Room sign. "Clean rest rooms—another reason why motoring travelers in the Midwest plan their stops at Standard Oil dealers," reads the copy.

"Do you know what specific convenience 'Gets 'em in' and 'Brings 'em back?' " asks the Standard dealers' Question Bee. The answer, found by revolving one disc of the Question Bee on top of another, brings the answer, "Conveniently located, clean rest rooms."

"Low-cost-per-mile" will be the theme of the Standard's special summer gasoline advertising, beginning the last of May and continuing the rest of the summer. Pictures of popular forms of summer recreation and Standard dealer stations will suggest driving by automobile and where to buy gasoline.

A Scotch lassie in kilts will dramatize the selling point, "low-cost-per-mile," as a 9-foot full color cutout at Standard oil dealers and as an illustration on a 24-sheet color poster. An Iso-Vis motor oil advertising campaign of newspapers and curb signs will run concurrently with the gasoline campaign.

Oil Company's Dilemma

N. P. N. News Bureau

NEW YORK, May 1.—The Governments all want us to pay higher taxes and provide more employment; the employes want more wages; those who sell to us want us to pay more; those who buy from us want to pay less, and the stockholders want more dividends, points out John A. Brown, President of Socony-Vacuum Oil Co. in a letter to stockholders.

N. P. N. Inspection Forms Aid Jobbers in Checkup

(*Continued from page 9*)

track for rendering a valuable service to the oil industry, and I extend my hearty congratulations to you for the aggressive efforts in the service thus rendered.

"The NPN analysis of bulk plant operating costs (Minimum Profits Standards) is very interesting, and insofar as our own experience is concerned it would appear that your analysis is very representative as a cross section of bulk plant costs, realizing of course, that every bulk plant has conditions that are peculiar to that operation, which will influence costs."

Dixie Marketer Quoted

At Ann Arbor, Mich., Neil Staebler, prominent Dixie marketer and head of the Staebler Oil Co., commented as follows:

"The jobber is often so close to his plant that he does not see its many little faults, but these NPN Bulk Plant and Truck Inspection Forms will certainly eliminate that. I am going to take these forms and make an inspection of our equipment with our plant manager. We make a regular routine inspection of our plant that is general in nature, but these NPN Forms go into more detail and will undoubtedly uncover many things that we have overlooked."

National Petroleum News Minimum Profit Standards for bulk plants, tank trucks, service stations and for service station cleanliness, another part of the N.P.N. spring rehabilitation program for oil marketing companies are republished on pages 32 and 33 of this issue.

At Toledo, Ohio, E. J. O'Donnell, president of the O'Donnell Oil Co. made the following comments:

"Your Bulk Plant and Truck Inspection Forms are a great idea, and NPN is doing a real service to the jobber by offering this assistance in the interest of better maintenance of equipment. I heartily recommend the use of these forms to all jobbers, and particularly to those in our association."

Another Ohio jobber, who has already used the inspection forms at his own plant, says the idea is a "thoroughly practical one and should materially benefit those jobbers who will take the time to completely check their equipment — then study the result—then do something about it".

"Hit The Mark"

Of NPN's Minimum Profits Standards, this jobber states, "Your standards have hit the nail on the head. I have studied them thoroughly with a great deal of interest in connection with my own bulk plant and trucks."

In checking over his plant and trucks with the NPN Inspection Forms, this jobber found many opportunities to improve his operating efficiency. Among the outstanding points which the Forms uncovered as needing attention were the following: tank car spur track not level; leak in the pump shaft packing; motor and pump not bolted to concrete base; tank ground connections not tight; rotted frame structure of truck loading rack; can racks and bucket boxes on truck not provided with wood buffers to prevent sparking; cracked wood sill on truck tank; no extra fuses or lamp bulbs carried in truck cab.

These are typical of the "discoveries" which the NPN Inspection Forms can make for any jobber. These forms will uncover many shortcomings in equipment that may be costing the jobber money every day he lets them go on.

Buys New Equipment

The plant and truck inspection may often lead to the glaring need for new equipment to replace or add to present equipment, just as it did for one eastern jobber. He reported that he was in the market for a new pump for his bulk plant and a new tractor for his semi-trailer as a result of the NPN Bulk Plant and Truck Inspection Forms.

This jobber reports that he had known for some time that his pump was worn out but that, when the inspection form called to his attention the many points at which a pump could give trouble through being worn out or not having had the proper care, he made the decision to get a new pump and eliminate one point of possible bulk plant inefficiency.

In studying his automotive delivery equipment in the light of the service it will be called upon to meet in the coming months of high gallonage, this same jobber realized that his present equipment was just able to take care of his deliveries and that, if trouble developed with any piece, he might be faced with delay and additional expense. So he decided to buy another tractor, which will lighten the strain on his present tractors and also take care of his needs if one of them is laid up.

Showed Up Housekeeping

Another independent jobber, this one in Ohio, discovered one point of poor housekeeping about his plant as a result of the NPN inspection forms. This was in the use of the space under his horizontal gasoline storage tanks as a storage place for pipe, discarded parts of gasoline pumps and other material of this kind. This was not inflammable material and there was no particular hazard involved in storing it there; but this jobber said he didn't realize how it looked to a visitor at the plant until his mind was called to the form in NPN on housekeeping at the bulk plant.

"I and the men have always taken real pride in the plant," this jobber said. "The tanks are kept painted, the lines, meters, pumps and so on are kept in good shape; but we had overlooked the unsightliness of junk placed where it can be as easily seen as underneath the storage tanks. Also it might be a possible safety hazard if a man had to move around there quickly."

For one jobber near the western boundary of Ohio, NPN's Minimum Profits Standards for bulk plants, trucks and service stations, have been particularly timely. This jobber, struggling with a reorganization plan for his company, has made a careful study of the April 13th and 20th issues of NPN, to see how nearly his own operations compare with those in NPN's standards yardstick.

Of the Inspection Forms, this jobber reports:

"There is a definite value in that sort of thing for the jobber who will study it and then do something about it. I have taken the last two issues of NPN home, those containing the data on Minimum Profits Standards, and am studying them in relation to my own business. They are proving very helpful to me."

In lower Michigan, a jobber has clipped from NPN the information on Minimum Profits Standards for clean rest rooms at service stations, and passed it on to his attendants to use in checking the appearance and cleanliness of their stations.

Jobbers are agreed that the need for putting plants and equipment in such condition that it will operate at the lowest possible cost is more vital today than ever before.

It is to this end that NPN offers the jobber its Minimum Profits Standards and Inspection Forms—to make it possible for him to widen his margin by lowering his cost of operation.

The Minimum Profits Standards on bulk plants and trucks were first published in the April 13 issue of NPN, beginning on page 25.

The Minimum Profits Standards on service stations were first published in the April 20 issue, beginning on page 25.

The Bulk Plant and Truck Inspection Forms were published in the April 27 issue of NPN, beginning on page 35.

192 Questions About Bulk Plants!
107 Questions About Tank Trucks!

A simple and practical method to check bulk plant and tank truck operating efficiency and a means to cut operating costs is contained in the Bulk Plant and Truck Inspection Forms, published in the April 27th Special Bulk Plant and Truck Inspection Issue of NATIONAL PETROLEUM NEWS.

These forms will take you right out into your plant and onto your trucks for a detailed check-up. Many jobbers have used them to check their own plants and are enthusiastic about their advantages.

This Special Issue of NATIONAL PETROLEUM NEWS also contains practical articles on bulk plant layout and operation on tank truck operations and so on.

A limited number of copies of this issue are still available. To make sure you receive those you need, send your order today, with remittance attached, to NATIONAL PETROLEUM NEWS, 1213 West Third St., Cleveland, based on the following prices:

Single copies	35 cents each
10 to 100 copies	32 cents each
100 copies or more	30 cents each

Chemurgists 'Whoop It Up' For Power Alcohol Plants

(*Continued from page 9*)

ing power alcohol as an economic solution for the farmer's troubles and as providing something superior to gasoline for motor fuel.

Oppose Legislation

At this meeting, the Farm Chemurgic Council announced itself as opposed to legislation to establish the marketing of alcohol-gasoline through compulsory regulations or through exempting alcohol from the state tax on motor fuel; however, it was brought out the council "fears" that the skepticism of oil companies regarding the superior qualities of the alcohol-gasoline motor fuel and their opposition, in some cases, to the promotion of alcohol plants would bring about such legislation through the "resentment and wrath of thousands of farmers who hope for full success of the effort."

Withdrawal of Chemical Foundation support of the National Farm Chemurgic Council was announced by Wheeler McMillen, president of the council. Support was withdrawn last summer, following the termination of the Foundation's principal income when certain important patents expired, he said.

Although some important grants have been made for chemurgic research during the past year, the council has found it necessary to finance itself through contributions and memberships of individuals and companies which have kept its small staff functioning and enabled its work to continue, McMillen stated.

Although $500,000 is available for building an Agrol plant at Sioux City, the budget of the council for the coming year has not yet been adequately provided, it was said.

Series of Testimonials

The Agrol session, with the exception of the "Progress Report" of Leo M. Christensen, vice president and general manager of the Atchison Agrol Co., was a series of testimonials by Agrol blend distributors, service men, users, and business men, mainly from Atchison, Kans., and Sioux City, Ia. where an active campaign for the second Agrol plant has been under way since January. A strong attraction of these proposed plants is that no local capital is risked in the plan offered by the Council.

No views in opposition were permitted expression on the Agrol session program in spite of the words of President McMillen at the opening conference session that "the critics are extremely welcome." Such criticism as was permitted to trickle in was read with inflections by and seasoned with the ridicule of W. W. Buffum, treasurer of the council, who substituted for an open forum at the close of the Agrol session.

The present stage of development is that Agrol fluid sales at the Atchison plant have jumped from an average of 6500 gallons per month for last November and December to an estimated 75,000 gallons during April, it was said. Total sales during the first quarter were reported as 123,518 gallons, with a steady increase during that period. Total production of the plant in 1937 was 88,682 gallons. The Agrol fluid is blended with gasoline, from five to 15 or 20 per cent of the fluid being used.

Sioux City Market

Sioux City is taking about one-third of the output of the Atchison plant, according to Dr. Christensen. Before a plant is built in Sioux City, a consumption of 90,000 gallons of Agrol fluid per month must be sold there, according to the original agreement. Both Sioux City and Chemurgic Council officials are optimistic the proposed plant will be started before the summer is over.

The economic soundness of power alcohol was said to be the last defense of the petroleum industry against the intrusion of "alky-gas" in the motor-fuel field. President McMillen, who made this statement at the opening session of the conference, added that the scientific questions seem to have been answered so completely and repeatedly that this criticism has virtually disappeared.

The fact that Agrol fluid now sells at the Atchison Agrol Co. plant at 25 cents per gallon, approximately five times the refinery production cost of gasoline, apparently causes small concern to Agrol backers. However, the existence of a doubt as to economic feasibility of this motor fuel was expressed by McMillen when he said, "ultimately the facts will be determined." If power alcohol is unsound economically, although present belief is to the contrary, the sooner that fact is established the better, he said.

The Agrol experiment is bound to be carried through regardless of opposition, according to its leaders, and the sympathetic co-operation of men in the petroleum industry can be more effective than any other move in averting discriminatory legislation, McMillen said.

Legislation to establish the use of power alcohol is opposed by the majority in the farm chemurgic movement, according to McMillen. The real danger of this undesired legislation lies within the petroleum industry itself, he said, because of tactics of some of its representatives who "distort the available facts" and thus arouse "resentment and wrath of the thousands of farmers who hope for the full success of the effort."

Just how this resentment is showing itself was apparent from the lengthy attack on "whispering campaigns" of oil interests in general and on Standard Oil Co. (Ind.) in particular, who were said to have used the removal of the district office from Sioux City in the midst of the campaign as economic pressure against the introduction of Agrol.

Dirty Work at Crossroad

By a little hotel lobby whispering with representatives of both sides of the issue, the extent of the intrigue at Sioux City was discovered. This whispering disclosed that some dastardly tricks had been perpetrated at Sioux City—by the other side. On the one side it was found that unfair pressure had been brought to bear upon the oil companies which forced them to spend money for new pumps and tanks to dispense the magic new motor fuel before there was any demand for it. Such tactics were resented by oil companies, it was declared, and forced them to raise their arms in self defense.

Agrol backers told stories of "lies about Agrol quality", sales of Agrol deliberately blended with inferior gasoline to create dissatisfaction, and unfair evidence of separation of gasoline and alcohol in the presence of water. Paul T. Beardsley stated that his Sioux City Agrol committee has succeeded to an extraordinary degree in smoking out this opposition.

All speakers on the program stressed, of course, the benefit to the farmer, many of whom are now said to have their backs to the wall fighting for new outlets for their overproduction, a result of replacement of horses with tractors, reduced exports and increased imports of farm products. A profitable new market for the products of 30,000,000 acres, or any important part, ought to increase the total demand for petroleum products more than enough to offset any probable substitution, said McMillen.

Raw Material

Chief raw materials now used at the Atchison plant are corn and kafir, although a few tons of artichokes have been used recently, Dr. Christensen stated in his "Progress Report". Grain supplies have had to be brought from a radius of several hundred miles, much of the grain used being grown in Missouri and Iowa. It is desired eventually to secure all raw material within a radius of 30 to 50 miles. Farmers will be expected to deliver their grain to the plant in the same fashion as they have long delivered grain to the flour mill to be ground.

In 1937 the leading raw material used in alcohol production at Atchison was black strap molasses totaling 244,383 gallons. Corn, the leading grain product, totaled a little over 14,000 bushels or 792,716 pounds.

Sorghum grain prices have averaged 85 cents per hundredweight since the beginning of the year, Dr. Christensen said. On the basis of average yields in Atchison county during the

FACTS ABOUT AGROL MOTOR FUEL

A National Petroleum News staff writer spent last week attending the meeting of the Fourth Annual Farm Chemurgic Conference in Omaha, in making a visit to the first, and so far only, plant sponsored by the Farm Chemurgic Council for making power alcohol fluid for blending with gasoline for motor fuel and in talking with business men and oil men in the districts where the Agrol motor fuel is being sold.

He collected data on the operation and cost figures of the Atchison, Kans., Agrol plant and its relations with oil companies and farmers from whom it buys produce to convert into alcohol.

His impressions and observations and study of the facts he collected will be published in the May 11th National Petroleum News.

past season and the market prices of this year, the local production of sorghum grains would have yielded the growers at least $2,000,000 greater income than they realized from the same 40,000 acres in corn, according to Dr. Christensen. Every effort should be made to accelerate the present trend away from corn and toward grain sorghums, he said, for raw material for alcohol plants.

Production Cost Cut

One of the advances in production methods made during the past year has been a change in denaturing which has reduced the cost per gallon from 6.74 cents to 2.58 cents per gallon. Denaturants of Agrol fluid now consist of 7½ parts of crude synthetic methanol, 7½ parts of refined methanol, and .001 part of mixed isonitriles. The crude synthetics are said to have constituents which are good top cylinder lubricants and all denaturants are said to have anti-knock characteristics. Plant denaturing equipment is expected to cost one-fourth of the $55,000 spent in the Atchison plant.

Yield of anhydrous alcohol at present was said to be four gallons per hundredweight with cattle feed (28% corn distillers grain) recovery of 31 pounds per cwt. About 25 pounds of carbon dioxide per hundredweight is being blown to the air. Present return on the feed is $25 per ton which is low, according to a St. Louis purchaser, and may be expected to increase during the next year. In contracts offered to farmers at Atchison, it is computed at $40 per cwt. as part payment for grain.

Operating Problem

By increasing the alcohol yield to 4.5 gallons per cwt. the feed quality would be improved from 28 to 32 per cent protein content, but this was said to be uneconomical now because the feed market will not pay a premium for distillers grains of higher than 28 per cent protein content and the yield of this quality feed would be reduced.

Installation of a dry ice plant is still in the formative stages at Atchison although offers have come from interested firms to build an adjoining plant, it was said. The total income per gallon of alcohol produced would then be 25 cents for alcohol, plus nearly 10 cents for feed, plus whatever might be derived from dry ice.

"The rapid development of the Sioux City project indicates clearly that these new plans (for Agrol plants) may be needed there in the very near future, and it seems likely that five or six other Agrol plants may be in course of erection within a year," Dr. Christensen said. "It is therefore necessary that we give careful consideration to the means by which this expansion can be kept on a technically and economically sound basis," he concluded.

Automotive Fuel Topics Listed For Natural Gasoline Meeting

N. P. N. News Bureau

TULSA, May 3. — Emphasizing the importance of natural gasoline in today's motor fuels, the Natural Gasoline Assn. of America, in its 17th annual convention here May 11-13, will devote a technical session May 12 to automotive fuels. Two papers will be presented there, one from the automotive engineer's and one from the natural gasoline manufacturer's point of view.

"Road Test Methods and Results From the Standpoint of the Automotive Industry" is the title of a paper prepared by W. G. Lovell, J. M. Campbell and M. J. Mulligan, of General Motors' Research Laboratories.

"The Fuel System Characteristics of Vapor Locking Automobiles, as Determined by the Pawhuska Road Tests of 1937" will be a careful technical summary and presentation of the results obtained by the test group operating last year under the auspices of the Western Petroleum Refiners Assn. and the Natural Gasoline Assn. A considerable number of automotive men have been invited to be present to join in the discussion to follow the presentation of the papers.

In another technical session the morning of May 12, R. C. Alden, research director of Phillips Petroleum Co., will discuss natural gasoline marketing policies, emphasizing the necessity of selling the inherent qualities of natural as a means of maintaining a healthy price situation. Alden's paper will be discussed by Mark Patton, of Hurley Gasolines Sales Co.

N. P. N. Man To Speak

"Trends in Refining Processes and Their Effect on Natural Gasoline Operations", a subject of primary interest to natural operators now, will be summarized by Arch L. Foster, technical editor of NATIONAL PETROLEUM NEWS, in a paper which will deal especially with the economics of the utilization of light hydrocarbons from refineries and natural gasoline plants and the effect of new process developments on the balance of production and supply in the natural gasoline industry. C. R. Williams of Continental Oil Co. will criticize this paper.

At the same session a paper entitled "Modern Improvements in Natural Gasoline Manufacture," will be presented by H. H. Beeson, Sabine Valley Gasoline Co., Shreveport. Ray E. Miller, of Hanlon-Buchanan, Inc., Tulsa, will preside at this session of the convention.

Opening the convention on May 11, J. W. Newton, vice president of refining for Magnolia Petroleum Co., will speak on the relations between the two branches of the industry. J. A. LaFortune, vice president of Warren Petroleum Corp., president of the association, will deliver his annual address, followed by reports of the several committees.

A large number of entries for the "Operating Kinks" session May 13 have been received and this session promises to be the best on this subject held so far. Original operating ideas for solving plant problems are presented. Awards for the best Kink in each class are made by an association committee. F. E. Fisher, Skelly Oil Co., is in charge of this session.

The evening of May 13 the natural gasoline meeting registrants will be given a preview of the International Petroleum Exposition, as the guests of Warren Petroleum Co. at a barbecue dinner served in the new air-conditioned cafe-cafeteria just completed on the Exposition grounds. The exposition opens formally the following morning.

John M. Landon Dies

KANSAS CITY, April 30.— John M. Landon, 81 years old, died April 27 in a Kansas City hospital, following several heart attacks. His son, Alf M. Landon, former governor of Kansas and Republican nominee for president in 1936, was at his father's bedside when death came.

The elder Landon operated as an oil producer in western Pennsylvania before moving to Kansas in 1904. He came west to be receiver for a natural gas company and remained to engage in the then new fields of Kansas. Alf Landon is the sole survivor of the immediate family.

G. E. Goddard Promoted

BARTLESVILLE, April 30.— George E. Goddard has been appointed manager of the oil production division of Cities Service Oil Co., succeeding the late M. R. Shaffer. Mr. Goddard has been purchasing agent for the company since Jan. 1, 1936, but his previous experience was all in the producing division of the industry. He has been with Cities Service companies since 1917.

Harris Bateman, assistant to Mr. Goddard, was appointed purchasing agent. He is an engineering graduate of Oklahoma A. & M. College and has been in the Cities Service organization since 1927, serving successively in the pipeline, engineering and refinery construction departments. He has been in the purchasing department since 1933.

Cleveland Oil Companies Renew Union Pact

N. P. N. News Bureau

CLEVELAND, May 2. — Major oil companies here renewed agreements, without change, negotiated one year ago with service station and truck drivers unions.

In contrast with previous years, when there were strikes and threats of strikes, there was no protracted debate this year, but the agreements were automatically renewed.

Dick Fawcett Dies

N. P. N. News Bureau

TULSA, May 2. — E. W. (Dick) Fawcett, well known refined oils salesman in the middle west, died suddenly at Las Vegas, N. M., April 26. Fawcett, son of J. A. Fawcett, head of the Crystal Oil Works, Oil City, Pa., came to Kansas several years ago and joined the Midland Refining Co., at El Dorado, Kans., as sales manager. Later he joined the Vickers Petroleum Co. at Wichita as sales manager, and then became sales manager for the Independent Lubricating Co. of Topeka, Kan.

In 1935 he was secretary of the Kansas Oil Men's Assn. and at the time of his death was special lubricating oils representative for a number of refiners in the southwest and west. His headquarters was in Los Angeles.

CHICAGO, May 2.—The office of the central division of the American Petroleum Industries Committee here has been moved from 616 to 600 S. Michigan Ave.

Patent Covering Radiant Heater Tubes Is Issued

PHILADELPHIA, May 3. — Decision was returned by the Court of Customs and Patent Appeals here April 25, awarding all claims of the Alcorn Combustion Co. and Frank H. Praeger involving radiantly heated floor tubes, against Standard Oil Co. of Indiana and George W. Watts, who claimed the use of hearth tubes over an ash pit.

Because of the wide application of floor tubes in refinery stills, this litigation has attracted considerable attention among refining engineers and others interested in the design and operation of stills.

The two applications first came into interference five years ago, and the case was first decided in favor of Praeger. (Federal Reporter, Vol. 93, 2nd Series, p. 94). In a petition for rehearing an affidavit of record by Watts claiming prior use was considered, but the court found that this was not cause for changing the original finding that Praeger was the original inventor.

This interference originally involved nine patent applications. During the proceedings, Alcorn brought in a patent application, filed first on Jan. 31, 1927, which claimed the use of tubes placed outside the path of the combustion or heating gases and which absorb heat almost entirely by radiation. This patent has been issued as No. 2,113,331, and is claimed to cover present types of radiant heaters.

Patent Claims

A typical claim of this patent is:

"In an oil heating system in which heat is applied to the oil by different modes of heat transfer in different zones while flowing in succession through banks of oil-conducting heat-absorbing tubes within said zones, the method of heating the oil to elevated discharge temperature which comprises, producing in unobstructed radiant view of the tubes of a bank within one of said zones a current of hot combustion gases having substantial initial velocity therein, utilizing the directional effects upon said gases of their initial velocity and of their tendency to rise within said one zone to direct said current of gases in positive avoidance of, and along a path adjacent and substantially parallel to, said bank of tubes within said one zone, transferring heat of said gases substantially solely by radiation to said tubes within said one zone and reducing the temperature of said gases, and transferring heat, at least in part by convection, from said gases of reduced temperature to one of said banks of tubes within another of said zones.

"In a system of heating oil, the combination of a heating chamber, means for directing streams of hot combustion gases toward and into convective heat exchange with opposite walls of said chamber, said walls absorbing heat from said gases and reradiating the absorbed heat, and a bank of heat-absorbing tubes disposed intermediate said walls, without the paths of said streams of hot gases, any given cross-section of said bank of tubes receiving heat substantially solely by direct radiation from both of said oppositely disposed walls."

The Alcorn Combustion Co. will grant non-exclusive licenses to all now using or who may wish to use principles covered by the patents owned by that company, J. S. Alcorn, president, announces. This new patent covers furnace types such as Equiflux, Solvex, and many others now in general use, it is claimed.

Pipelines Slice Buying of Crude In Mid-Continent

(*Continued from page* 9)

ran in March, developed a figure of 449,193 barrels daily as the demand. Present allowable, a continuation of the April order, is 475,000 barrels daily.

A Sinclair Prairie representative said that its reduction has been caused by a decrease in refinery runs. The Sinclair plant at East Chicago is running 20,000 to 22,000 barrels daily against a capacity of 40,000 barrels and requirements at the Houston plant have been reduced 10,000 barrels. Plants at five other points will be shut down soon, it was said. Other companies, including Shell Petroleum Corp. and Standard Oil Co. of Indiana have reduced their requirements of crude.

The four companies having pipeline proration in Oklahoma are effecting a cutback of about 20,000 barrels daily. Conservation officer W. J. Armstrong said that he would recommend to the corporation commission that it reduce allowables in the pools affected by such pipeline restriction to conform to the percentage which these buyers are taking, giving opportunity for other purchases in the same pools to ask for increases. He said the law demands ratability of runs from properties and that the commission is going to try to restore it.

Rock Island Refining Co., May 1, applied a 20 per cent reduction to its takings in the Tatums and Sholem Alechem pools of southern Oklahoma, where other purchasers are practicing like restrictions.

Arkansas Hit

Arkansas, coming rapidly to the front with flush production for the first time in years, was hit by restriction of market when Lion Oil & Refining Co. announced its inability to take oil in the Schuler pool from any except its own and partnership wells.

The Lion has taken as high as 18,000 barrels recently in a day from this pool; its approximate taking under the new plan was around 9500 barrels. Root Refining Co. is the only other purchaser in the field. Schuler was discovered early in 1937, had its deep sand discovery months later.

Louisiana's Conservation Commissioner announced the May allowable production of that state as 251,450 barrels, a decrease of 825 barrels daily from the April figure. The Bureau of Mines forecast of demand for Louisiana crude in May was 243,200 barrels daily.

Every state in the Mid-Continent and southwest is today affected in some degree by pipeline proration and the state regulatory commissions are hard pressed to bring their allowables down to the level of the demand thus indicated. Purchasers who comment on the situation say there is no prospect of an improvement in their demand for crude.

Tank Trucks Among Topics Listed For N.F.P.A. Meeting, May 9-12

CLEVELAND, May 2. — A variety of subjects, ranging from trailers and trailer camps to automatic sprinkler protection in Australia, are included in the program for the 42nd annual meeting of the National Fire Protection Assn., to be held May 9-12 at Atlantic City, N. J.

Of particular interest to oil men will be the following committee reports to be given at the morning session May 10:

Storage and handling of liquified petroleum gases, and tank trucks for transporting those gases.

A suggested ordinance for petroleum wharves to be presented for final adoption; also amendments to the oil burner regulations.

A tentative report designed to secure comments, and covering such subjects as driver training, vehicle operation, and fire extinguishing equipment in connection with truck transportation.

Each day will be split up into morning, afternoon, and evening sessions, with all but the afternoons being given over to committee reports. The meeting will be held at the Haddon Hall Hotel.

BOLSA CHICA PRESIDENT

N. P. N. News Bureau

LOS ANGELES, April 30.—H. P. Grimm, independent oil operator and formerly president of Pacific Western Oil Co., last week was elected president and a director of Bolsa Chica Oil Corp. to succeed C. W. Lord, resigned.

Mr. Grimm was one of four members of the directorate nominated by an independent committee in a drive for change in management and a board of directors more representative of stockholders. The other three included Mrs. Dora R. Augur, large individual stockholder, Paul T. Sunday, chairman of the committee, and Thomas W. Simmons, independent oil operator.

Three members of the former board were returned: R. R. Templeton, Clyde E. Blosser and E. H. Blanche.

D. C. 'Gas' Tax Collections Up

By Teletype

WASHINGTON, May 3.—Collections of the 2-cent District of Columbia gasoline tax during the first three months of 1938 totaled $596,671, compared with $576,386 for the same quarter last year.

McColl-Frontenac Proxy Fight Predicted

TORONTO, April 30. — Fight for proxies at the annual meeting of McColl-Frontenac Oil Co. Ltd., to be held on May 26, in Montreal, was foreseen here following the reported acquisition by The Texas Corp., of slightly over 30 per cent of the outstanding common stock of 766,783 shares.

Interest of the present management of the company, of which John Irwin is president, is stated to be somewhat less than 30 per cent, so that control of the company, as between the two contending parties rests in the hands of the public.

Producers And Refiners Are Urged To Hold Back As Demand Increases

WICHITA, Kans., May 2. — To achieve economic stability, as expressed in terms of gasoline stocks as of the end of the year, the oil industry should not raise its operating levels in coming weeks, as the season of enlarged consumption is entered, though this is contrary to normal operations.

This warning was expressed by two prominent speakers before the quarterly meeting of the Interstate Oil Compact Commission here April 29 and 30.

Crude oil run to stills in 1938 should not average more than 3,188,000 barrels daily and domestic production of crude should be held to an average of 3,392,000 barrels daily, Dr. Joseph E. Pogue, vice president of the Chase National Bank, New York, told the commission and the large audience which attended its open meeting here the first day.

Asserting that producers must not expect an increase in crude oil allowables during the coming summer, if waste is to be prevented, Charles F. Roeser, president of the Independent Petroleum Assn. of America, said production east of California must be maintained at about 2,700,000 barrels daily.

The figures given by both these authorities represent about the current level of operations of the industry. For the week ended April 23, the American Petroleum Institute reported production east of the Rockies as 2,711,000 barrels daily and total production in the country as 3,440,000 barrels daily.

New estimates of motor fuel and fuel oil demand for 1938 were given the oil compact commission by Dr. Pogue. He estimated for the year an increase in domestic consumption of motor fuel of 1.3 per cent and an increase in exports of 9.6 per cent, an advance in total motor fuel consumption of 1.9 per cent.

He estimated that domestic consumption of all fuel oils would decline 6.9 per cent and exports 0.8 per cent, making a decline in total consumption of these products for the year of 6.4 per cent.

A thunder cloud blew over the commission's meeting the first day, charging the atmosphere with electricity and producing a few small bolts.

Gov. Walter A. Huxman, of Kansas, said that the compact must be re-formed to meet current problems. Specifically, the governor's problem is that the Kansas producers are not selling enough oil.

Kansas' Plight

He expressed the opinion that Kansas is being apportioned its part of the present market based upon a formula arrived at in 1933 during the oil code days, when the Bureau of Mines first began to forecast demand by states. Since then, he said, Kansas' potential production has gone from about 300,000 barrels daily to 3,000,000; but its share of the markets has by no means been increased proportionately. Kansas producers, he said, are in sad plight and new wells require five and six years to return the drilling investment.

There is lack of parity, said the governor, between the allowables of Kansas fields and many other sections.

He said that, if federal control is the only way that equity can be done to his state, then he will join in the demand for such control. First, however, he insists that the compact be given authority to do something about the problem. It is now like the old League of Nations, he asserted, impotent to meet the needs of the times and confined only to discussion.

Justice for Kansas, said Gov. Huxman, is his principal concern and whatever measures are needed to bring that about will receive his support. Among remedies which he mentioned, if other means are not found quickly, is separation of pipeline and purchasing companies.

Gov. Huxman set no date for his entering the field for federal regulation, or control, of the industry, but he said that immediate action through the compact, or somehow, is imperative.

No direct reply to the Kansas governor was made by Col. Ernest O. Thompson, member of the Texas Railroad Commission and chairman of the Interstate Oil Compact Commission, noted for his opposition to federal control, but at the conclusion of the first day's meeting he asserted that there will be no "abdication" of the duty of the states to regulate their own affairs.

"We have here a great forum for an intelligent approach to our problem," said Col. Thompson. "There is as much brains and energy in the sovereign states as there is in the federal government; in fact, states make up the whole federal government."

The Interstate Oil Compact Commission, it is generally recognized, cannot re-form itself along the lines he proposed. It is limited by its charter to the discussion of means of preventing physical waste of oil and gas and the recommendation of laws to the legislatures of the compacting states. To the effect the change demanded by the Kansan would require the approval of the several legislatures and of Congress.

Further opposition to Gov. Huxman's position was voiced by Dr. Alexander Sachs, economist, New York, one of the programmed speakers before the commission's meeting, who surveyed broadly the field of economics and administrative trends. The compact, he said, fitted admirably into the peculiar genius of the American people and with certain extensions of its scope, well within its present charter, would make the oil industry unique in the matter of self-regulation and preservation of competition. He suggested that the compact have a technical sub-committee which would engage in long range planning, anticipating trends and practices and not merely noting the day to day crises the meeting of which depends upon doing something immediately.

Concerning this immediate situation and the necessities of the industry for the next few months, President Roeser, of the Independent Petroleum Assn., of America asserted that producers must not expect any increase in crude oil production allowables during the summer months, if waste is to be prevented.

Stocks Figures Given

Roeser quoted figures which had been set out in a statement issued by the executive committee of his association, which met in Wichita the day preceding the compact meeting. He said that the industry suffered last year from excess production of about 45,000,000 barrels, which is now represented in excessive inventories of refined products and crude oil. To reach a sound inventory position by Oct. 1, stocks of motor fuels should be reduced to about 62,000,000 barrels. On March 31 these stocks were nearly 93,000,000 barrels. To accomplish the reduction, said Roeser, it will be necessary to maintain a production level for the territory east of California of about 2,700,000 barrels of crude oil daily.

Roeser declared that reduction of inventories would have to be achieved through production restrictions imposed by the officials of states. The refiners who hold most of the gasoline stocks cannot work together in this direction, he said, in the light of the decision at Madison which makes "any agreement a bad agreement."

The same position with respect to increases in crude oil output was taken by Dr. Pogue, who last October warned the compact meeting in Houston of the "recession" which not long thereafter made its appearance.

Overproduced in 1937

"In respect to its problem of balancing supply and demand, the petroleum industry is concerned with the desirability of shaping its operating sched-

Oil Compact Commission Asks Refiners to Curtail Runs

WICHITA, Kans., May 2.—All refiners will be asked by the Interstate Oil Compact Commission to reduce their runs 15 per cent through May and June so that stocks may be reduced.

The oil compact commission at its meeting here last week voted to make a formal request of all refiners to curtail their runs. This follows out a suggestion made at the April hearing of the Texas Railroad Commission by Col. E. O. Thompson, who is chairman of the compact group.

Carrying out the suggestion of Dr. Alexander Sachs, New York economist, Chairman Thompson appointed the committee's first advisory committee on economics. It will be a five-man committee. Members so far appointed are Dr. Sachs, Dr. Joseph E. Pogue, of Chase National Bank, New York, and E. L. DeGolyer, Dallas geologist.

Next meeting of the compact commission will be held in Colorado Springs, late in July.

ules throughout the remainder of 1938 to the end that there may be sufficient margin between demand and supply to permit surplus inventories to be reduced and economic equilibrium to be reestablished," he said. "As a result of overproduction in 1937 and some overages in the first quarter of 1938, the industry has an inventory that stands in need of liquidation. This fact, therefore, may properly be taken into account in establishing production schedules.

"In the 12 months ending Feb. 28, 1938, stocks of refinable crude oil increased 16,400,000 barrels; stocks of motor fuel, 14,300,000 barrels and stocks of all other products, 25,300,000 a total addition to storage of 56,000,000 barrels, or an average of 153,400 barrels per day. This volume, in general, should be viewed as advance production that does not need to be produced a second time.

"What then should be a reasonable production schedule for the final three quarters of 1938? In order to compute the basis for such a program, estimates must be made and certain inventory objectives for the year-end set up.

Motor Fuel Demand

"First, it is estimated that for the year as a whole domestic consumption of motor fuel will increase 1.3 per cent and exports of motor fuel will increase 9.6 per cent, making an advance in total motor fuel consumption of 1.9 per cent. Second, it is estimated that domestic consumption of all fuel oils will decline 6.9 per cent and exports thereof will fall 0.8 per cent, making a decline in total consumption of 6.4 per cent. Third, it is assumed that on Dec. 31, stocks of motor fuel should not exceed the average of the number of days' supply that prevailed at the close of 1936 and 1937 . . . . . .

"It thus appears that . . . . . crude oil to stills in 1938 should not average more than 3,188,000 barrels daily; and domestic production of crude oil should be limited to an average of 3,392,000 barrels daily. It may be noted further that these levels are almost identical with current rates of operations.

"Thus the conclusion emerges that the petroleum industry should not raise its operating levels as the season of enlarged consumption is entered, despite the temptation to do so, but should run counter to its normal habits of seasonal expansion."

Everett L. DeGolyer, Dallas, geologist and oil producer, said that one of the most difficult matters is the reallocation of markets in the light of the production situation and he expressed doubt that anyone today knows how that job could be done.

He gave some figures as to production of four large producing states expressed in daily fractional parts of their estimated reserves. The U. S. as a whole is producing one-forty-five hundredth part of its total reserves daily, he said. The figure for Oklahoma—the denominator of the fraction—is 3100; Kansas, 8500; Texas, 6100 and Louisiana, 2800. Thus, of the four states, Louisiana is using its proved reserves fastest, Kansas at the slowest rate, he said.

Dr. A. H. Bell, Illinois Geological Survey, said that, since Jan. 1, 1937, 12 pools have been opened in that state and that there are now in those pools 428 producing wells averaging 30,700 barrels daily. Only 25 of the present number of wells flow and all of these are in the Noble pool. Wells decline rapidly and there is little pressure. Total production from the new pools in 11 months has been 6,200,000 barrels.

Dr. Bell asserted that production is now showing a tendency to level off. The new Centralia pool, which was hit by restriction of pipeline runs on April 20, had 103 wells at that time and has produced 264,000 barrels. It was making 6200 barrels daily when the purchasers imposed a limit of 20 barrels per well daily. The field was discovered in December of last year and is considered now to have 600 proved acres, and not fully defined.

Final day's session April 30 was devoted chiefly to routine business, enlivened briefly by a debate on well spacing with representatives of New Mexico, Oklahoma and Illinois ganging up on Thompson. Their contention was that too many wells have been drilled and that Texas was a prime offender. Thompson asserted that in his state every landowner is legally entitled to drill on his land no matter what the area.

Seubert, of Indiana Standard, 'Hopes' Crude Price Will Hold

N. P. N. News Bureau

CHICAGO, May 2. — E. G. Seubert, president of Standard Oil Co. of Indiana whose subsidiary, Stanolind Crude Oil Purchasing Co., is one of the largest purchasers of crude oil, "hopes" that there will be no cut in crude prices.

Asked at his annual press conference April 28 if he anticipated a crude price cut, Seubert replied, "I hope that there will be no reduction in crude prices."

Seubert, however, declared that there has been too much crude produced, too much crude run to stills, and that inventories "are entirely too high." He pointed out that, roughly, there are 90,000,000 barrels of gasoline ready for shipment and that crude stocks are over 300,000,000 barrels.

The Indiana Standard has reduced its gasoline stocks more than 1,000,000 barrels in the past few months, Seubert said.

Leasing Bulk Plants

Questioned about the policy of some major companies in leasing out their bulk plants to independent jobbers to market the lessor's products, Seubert said that the Indiana company has not yet adopted this plan but it may eventually come to it.

Seubert said that from his observations he believed that the petroleum industry was less affected by the recession than any other industry.

Available figures indicate that gasoline sales volume for the first 1938 quarter increased slightly, although realizations were much less, the Indiana president added.

Sales of industrial lubricating oils and heavy fuels have been considerably lower in volume due to lack of activity in mills and factories, although gasoline and light fuels have generally kept close pace with last year's sales, he said.

New Derby Oil President

By Telegraph

WICHITA, Kans., May 3.—Carl Fisher, oil operator in Kansas with headquarters in Wichita, was elected president of the Derby Oil & Refining Corp., at the board of directors meeting here April 30. He succeeds Berkley Williams of Richmond, Va., who resigned to devote his time to his other business interests. Williams had been one of the organizers with A. L. Derby of The Derby Co. Fisher was elected a member of the board at the stockholders' meeting in Jersey City, N. J., recently.

I.P.A.A. Warns On Over-Drilling

WICHITA, Kans., April 30.—The executive committee of the Independent Petroleum Assn. of America, representing independent producers, meeting here April 28, just ahead of the meeting of the Interstate Oil Compact Commission, warned against excessive drilling in proven fields.

"The increasing tendency to continue the practice of drilling unnecessary wells within proven fields is having the effect of causing a declining per well allowable for existing wells," said the statement released by the committee. "We again call the attention of the producers of the U. S. to this dangerous tendency to add unnecessary costs to an already over-burdened industry."

More equitable allocation of allowable production between states, and also between flush fields and fields of settled production was urged by the committee. "In some areas there has been a tendency on the part of some producers, who are indifferent to sound conservation principles, to produce oil from certain wells in such large quantities as to create underground physical waste.

"The action of purchasing companies in some states in prorating wells of small and settled production, while at the same time they are taking oil from the larger or flush producing wells in excessive quantities, is contrary to sound conservation practices and should be discouraged. The carrying out of a sound conservation program necessitates flush wells bearing the greater burden of proration in order to conserve reservoir energy."

The committee's statement also presented figures on the industry's excessive inventory situation, which was enlarged upon by Charles F. Roeser, president of the producers' association, in his talk before the Interstate Oil Compact Commission the following day, in which he advised producers they could not expect any increase in crude oil production allowables during the summer months.

Northwest Petroleum Assn.

MINNEAPOLIS, May 2.—The convention of the Minnesota division of the Northwest Petroleum Assn. will be held Jan. 26 and 27 at Lowry hotel, in St. Paul, Elwin E. Hadlick, president, announced today. Meeting place of the North Dakota division will be announced later.

'Gas' Stocks Dropped Steadily During April, A. P. I. Reports

N. P. N. News Bureau

NEW YORK, May 3. — The decline in motor fuel inventories which has been underway since the beginning of April continued through the last week of the month, according to report of the American Petroleum Institute today. Stocks of finished and unfinished gasoline decreased 140,000 barrels.

Crude runs were jumped 65,000 barrels on daily average last week, the operating rate at plants reporting to the Institute increasing from 77.6 per cent to 79.3 per cent of capacity. Gas and fuel oil stocks rose 1,122,000 barrels.

Texas-Gulf and East Coast plants accounted largely for the increase in crude runs. Daily average throughput in these two districts was up 41,000 barrels and 15,000 barrels, respectively.

The Oklahoma - Kansas - Missouri district showed a decline of 13,000 barrels in daily average runs, and runs were off slightly in the Louisiana-Gulf and North Louisiana-Arkansas districts, but increased crude throughput was reported by all other districts.

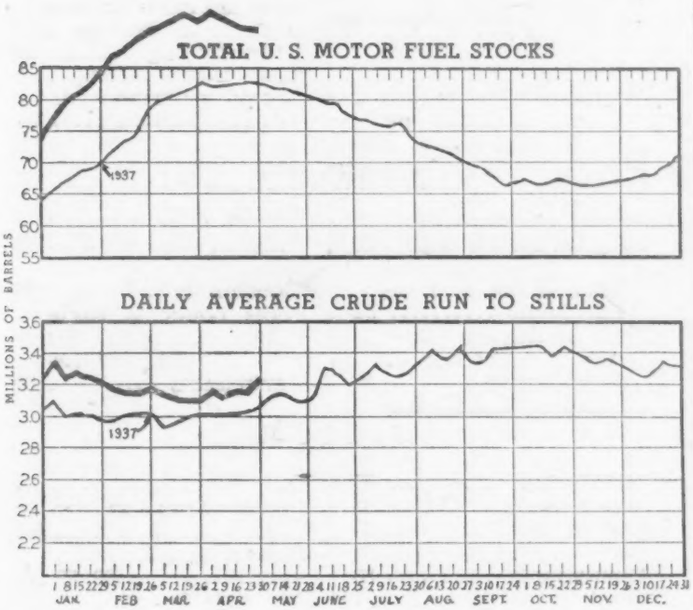
Indiana-Illinois-Kentucky refiners reported a 273,000-barrel reduction in motor fuel inventories. Oklahoma - Kansas - Missouri stocks were down 66,000 barrels. Changes in other districts were relatively small.

Current inventories of motor fuel continued well above the level of a year ago. Stocks April 30 for the country as a whole totaled 91,339,000 barrels, as compared with 80,667,000 barrels on the same date in 1937.

Stocks of gasoline at bulk terminals and intransit were unchanged at 24,568,000 barrels on April 30. Unfinished stocks were down 42,000 barrels with refinery stocks declining more than twice this much.

The Texas-Gulf district accounted for 525,000 barrels of last week's 1,122,000-barrel increase in stocks of gas and fuel oils. The U. S. total hit 128,270,000 barrels on April 30 and at this level they were 34,063,000 barrels, or approximately 36 per cent, above inventories on the same date last year.

Stocks of gas oil and distillates increased 323,000 barrels, residual fuels 799,000 barrels, last week.



DAILY AVERAGE PRODUCTION IMPORTANT DISTRICTS
American Petroleum Inst. Figures

	Week Ended April 30 Barrels	Week Ended April 23 Barrels
Oklahoma City	101,750	123,500
Total Okla....	473,900	499,400
East Texas ...	433,200	432,400
Total Texas...	1,352,700	1,339,550
Kansas	177,750	181,900
Louisiana	260,600	262,500
California	709,000	728,900
E. of Rockies..	2,687,150	2,711,200
Total U. S.....	3,396,150	3,440,110
Crude imports.	44,710	83,140
Tot. new sup'ly	3,440,860	3,523,240

New Unit for Derby Refinery

By Telegraph

WICHITA, Kans., May 3.—Orders have been placed for materials for a new vacuum unit at the Derby Oil & Refining Co.'s refinery here. The unit will handle 8000 barrels of crude daily, reducing it to virgin asphalt. Engineers for Winkler-Koch Engineering Co. are supervising the construction. The unit is expected to be in operation by July 1. A large water cooling tower, to be used in connection with the unit, already has been completed.

Five Tax Resolutions Passed in W. Va.

PARKERSURG, W. Va., May 2.—Five resolutions against gasoline taxes were passed by the first annual meeting at Charleston last week of the West Virginia Petroleum Assn.

The first resolution asked that the gross sales taxes on the production of petroleum be reduced by the state by at least 50 per cent, because the heavy production taxes, in the form of gross sales taxes, are in addition to real estate taxes and other levies collected by the state. Another resolution asked that the one-cent state emergency tax on gasoline, collected in addition to the base tax of four cents, be permitted to expire in 1939.

A third resolution set forth that West Virginia has the second highest per capita state highway debt in the country, equivalent to $293 for every motor vehicle registered in the state. Nevertheless the average value of all automobiles is estimated at $238, thus making the highway debt of the state far in excess of the total value of its motor vehicles. Therefore, the resolution asked that the financing of state highways be placed on a more conservative basis than the present debt now in excess of $50,000,000.

A fourth resolution called upon oil men in West Virginia to resist any attempts to further tax the motorists, and a final resolution called upon the state legislature to forward a memorial to Congress urging repeal of the federal gasoline tax.

Speakers included B. H. Markham of New York, chairman of the American Petroleum Industries Committee, and Maurice F. Hanning, Cleveland oil attorney.

CURRENT REFINERY OPERATIONS

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills (Barrels) Week Ended		Per Cent of Reporting Capacity Operated Week Ended		Stocks (Thousands of Barrels) Total Finished and Unfinished Motor Fuel* Week Ended		Stocks of Gas and Fuel Oil Gas Oil and Distillates Week Ended		Residual Fuel Oil Week Ended		Total Week Ended	
		April 30	April 23	April 30	April 23	April 30	April 23	April 30	April 23	April 30	April 23	April 30	April 23
East Coast	100.0	493,000	478,000	73.7	71.4	22,757	22,809	3,303	3,174	6,599	6,554	9,902	9,728
Appalachian	88.4	108,000	108,000	83.7	83.7	3,465	3,447	421	394	944	931	1,365	1,325
Ind., Ill., Ky.	92.4	417,000	411,000	85.3	84.0	15,017	15,290	2,369	2,375	5,367	5,241	7,735	7,515
Okla., Kans., Mo.	84.7	262,000	275,000	68.4	71.8	8,134	7,968	949	934	2,715	2,683	3,664	3,592
Inland Texas	56.6	135,000	122,000	67.2	60.7	2,628	2,640	366	339	1,259	1,216	1,625	1,555
Texas Gulf	95.7	787,000	746,000	98.7	93.6	13,627	13,549	2,664	2,442	6,059	5,756	8,723	8,198
La. Gulf	96.6	132,000	134,000	78.6	79.8	2,275	2,304	1,153	1,339	1,834	18,836	2,987	3,175
No. La., Ark.	63.7	42,000	43,000	82.3	74.1	529	585	153	144	456	435	699	579
Rocky Mt.	69.7	51,000	47,000	72.4	75.8	2,275	2,244	133	126	663	657	795	783
California	90.9	509,000	508,000	68.2	68.1	15,672	15,682	9,419	9,510	73,844	73,618	83,263	83,128
Total Reporting	89.0	2,936,000	2,872,000	79.3	77.6	86,379	86,519	20,969	20,647	104,710	103,931	125,679	124,578
Estimated U. S. Total (Bur. of Mines Basis)		3,215,000	3,150,000			91,339	91,479	21,483	21,157	106,793	105,931	128,270	127,148

*Includes stocks at refineries, in bulk terminals, pipe lines and in transit.

620,000 Barrels Daily Is Goal Of Calif. Producers

(*Continued from page* 11)

actual market requirements. It was felt the bureau's method of estimating month-to-month demand could not be applied to the California situation in the present emergency.

An unprecedented sharp rise in crude production, plus unpredictable curtailment of market demand due to "unusual" climatic conditions, strikes, curtailed passenger ship travel from California ports—ships being transferred to other runs—and the possibility of reduced offshore movement of California products have combined with the current business depression to affect the California situation.

A recommendation by the California allocation committee pointed to the likelihood that the state's crude output would have to be curtailed around the 640,000-barrel mark for the balance of the year.

In initiating its new drive for "real curtailment" and to put crude production more nearly in line with needs of the industry's marketing machinery on the Pacific Coast, the committee set the state's May production quota at "not to exceed 620,000 barrels daily."

This is a reduction of 78,700 barrels a day in the nominal quota in effect during April of 698,700 barrels, which conformed to Bureau of Mines recommendations. Of the curtailed quota, 4135 barrels daily were reserved to provide for new wells expected to be brought on production during the month, and allocated 615,865 barrels daily to individual fields.

In outlining the current crisis, committee chairman Vander Leck pointed out that for the seven months ended March 31, 20,000 barrels in crude oil and products were added to storage each month in the Pacific Coast territory. Of this total, he said, 14,000,000 barrels, or 155,000 barrels daily, were run to storage during January, February and March.

'Gas' Prize Contests Opposed By Jobbers

(*Continued from page* 12)

alized." He said that he believed that back of this trouble was the practice of the oil industry as a whole loaning equipment, expanding the number of service stations even faster than the phenomenal rate of increase in gasoline consumption.

At Quincy, Mass., Fred E. Bergfors, treasurer of the Quincy Oil Co., wrote: "Prices in Massachusetts for the past two years have been the lowest in the world and I suppose on account of this it is impossible for anyone to have anything to do with premiums. All other businesses here are practising the bank night plan, but the gasoline retailers are not."

R. W. Garber of Macon, secretary-treasurer of the Georgia Independent Oil Mens Assn., said that no bank night schemes have appeared in the state, apparently because theatres there were previously ordered to stop them.

Consumer 'Saves' 20c a Gallon on Gasoline—But It's Like 'Saving' by Shaving Yourself

N. P. N. News Bureau

WASHINGTON, May 2. — Without water transportation, gasoline would cost the consuming public 38 cents a gallon, the House of Representatives was told by Congressman Culkin, N. Y., during debate on the rivers and harbors appropriation bill authorizing appropriations for waterway improvements.

Development of water transportation has "saved" the consumer more than $4,000,000,000 a year—or about 20 cents a gallon, Culkin said.

This "saving", however, is just like the money a man "saves" by shaving himself instead of paying the barber 25 cents or more each day.

Speaking of the savings on all types of commodities resulting from waterways, Culkin said:

"It gives cheaper transportation to the American people. . . . I wish to call attention of the Members of the House to just one phase of these savings. May I say that since the inception of the republic, the country has spent on waterways, coastal and internal, approximately $2,200,000,000.

"The savings ot the people in one type of commodity, gasoline, results each year in a saving of $4,000,000,000—to be exact, $4,457,000,000 a year. That is on gasoline alone. One of the great oil companies meeting the challenge of the lobbying railroad groups, had expert accountants go into this question at length. These accountants established the fact that by reason of the intervention of water transportation itself, in our internal waterways and along the coast, by reason of specialized carriage of gasoline products, the saving to the public on a gallon of gasoline delivered at the pump amounted to 20 cents per gallon; that except for the intervention of water transportation and if the carriage of gasoline was by rail, the American people today would have to pay 38 cents a gallon for gas. They are now paying 18 cents per gallon.

"We consume in America annually, or did in 1937, 21,787,000,000 gallons of gas. With a saving of 20 cents a gallon, this puts into the pockets of the American people annually $4,357,000,000 a year by water transportation," Culkin said.

Contents

NEWS

Chemurgy Aims At Alky Plants for Farm Belt 9
Jobbers Check Trucks and Plants, Aided by N. P. N. Inspection Forms 9
Rival Gasoline Bank Nights Dazzling Motorists in Ohio 9
Pipelines Slice Buying of Crude in Mid-Continent 9
Truckers Beat Rails, New Law is Approved 10
Ethyl Case Trial is Delayed Again 10
620,000 Barrels Daily is Goal of California Producers 11
Toledo Price War Still Rages, Station Closing Threat Fades 11
Jobbers Are Opposed to Station 'Drawings' ... 12
Virginia Jobber Loses Fight on Tank Truck Inspection Fee 12
Boggs and Other Officers Re-elected by W. P. R. A. 13
Business Upturn Will Come in Fall, W. P. R. A. Told 13
Editorials 14
Refiners' Plight Laid to Double-Cross at Washington 15
K. S. Adams is New President of Phillips Co. 16
Clean Rest Rooms to be Theme of S. O. Indiana Newspaper Ads 16
Automotive Fuel Topics Listed for Natural Gasoline Meeting.... 19
Patent Covering Radiant Heater Tubes in Issue 20
Producers and Refiners Are Urged to Hold Back as Demand Increases 21
Seubert, of Indiana Standard, 'Hopes' Crude Price Will Hold 22
I. P. A. A. Warns on Over-Drilling 22
'Gas' Stocks Dropped Steadily During April, A. P. I. Reports 23

MERCHANDISING

Tulsa Expo Biggest Ever 25
Program for Oil Expo.. 30
Keep Tinsel from Overhead, Jobber's Business Motto 34
Sales of Regular "Gas" Gain, at Expense of Third Grade 38
Modernize Farm Kitchens Offer Kerosine Market 41
Automotive Notes and Comments 46
Prices Lower in April-June Contracts for U. S. Tank Car Requirements 50

MARKETS

Mid-Western 53
Mid-Continent 53
Eastern 53
Wax 53
Pennsylvania 53
Coastal 56
California 56
Fuel Oil 56
Refinery Tank Car Markets 54, 57
Tank Wagon Markets.. .....58, 59, 60
Seaboard Markets 61
Crude Oil Markets ..62, 63

DEPARTMENTS

New Equipment and the Manufacturer 45
New Patents 49

The Refinery Chemical Engineer Takes A Post-Graduate Course

By ARCH L. FOSTER, Technical Editor

With a 50% greater show than ever presented in the past, The Tulsa International Petroleum Exposition is rounding into the home stretch of feverish preparation for the opening May 14th. Well over 600 exhibitors will have booths in the new Show, to present for the inspection of oil men who come to get new ideas in methods, processing and above all, equipment to accomplish new or old jobs better, more efficiently and more economically. Sixteen new buildings have been added.

More than 300 of these exhibitors present equipment and process developments which are primarily for the petroleum refiner, the largest proportion of space and equipment ever assembled in this country or any other for the information of the refinery technologist, engineer and the business and technical executives who are charged with the maintaining the progress and welfare of the refining industry. Nowhere else can these men find assembled in easy reach everything in equipment and in process demonstration to bring them up-to-date on technical advances. Failure to keep in the forefront in knowledge of important process and equipment advances is the surest road to obsolescence and oblivion for the refiner.

Complete Equipment Display

The exhibits cover every type and design of refinery equipment, from a glass model of a refinery in operation, to the heaviest pumps used in cracking stills. The glass refinery model is being brought from the Chicago Museum of Science where it is on permanent exhibit.

A simple enumeration of equipment to be seen may seem tiresome. Yet, among the newer types of material is a new refractory cement used in furnace construction, which resists slagging and the corrosive-erosive action of acid sludge fuels. In the same lineup is a so-called super-refractory mortar used over the face of fire brick to prevent or lessen erosion produced by slag deposition. A whole list of protective coatings, many of them comparatively new, used as refinery protection against weather and other corrosion tendencies. A new sealing compound for leak-proofing joints will be demonstrated.

Corrosion Prevention A Major Problem

Corrosion, and its frequent attendant, erosion, is probably the cause of the most enormous maintenance item in the refinery, and has received an increasing amount of attention in recent years. The metallurgist is continuously perfecting an increasing list of alloys designed for application to specific refinery problems. High liquid velocity, high temperatures and pressures, corrosive liquids and gases, erosive conditions in cracking stills and numerous other problems have been met by alloys fitted to meet these difficulties. Several new still tube alloys, proved over a period of time in actual exacting service will be displayed, with voluminous data on these conditions and the results found in regular refinery use. Refrigeration to minus 75° F. and lower is demanding special alloys; low temperatures require specific properties which are not predictable from the properties of an alloy determined at atmospheric or elevated temperatures. Some interesting results have been obtained in using some new alloys for these purposes, and these results and the manufacturers' recommendations will be obtainable from the best qualified technologists.

New ideas are being brought out in such equipment as bubble caps, trays, down-spouts, and several will be shown at Tulsa. An interesting item is a new portable testing pump working to a maximum of 6000 pounds per square inch, invaluable engineers say for testing and inspection service in refineries, for valves, tubes and piping, pressure

Refining Technology

Contents

The Refinery Chemical Engineer Takes a Post-Graduate Course R-201

Combination Cracking Economics . . by Eugene R. Smoley R-203

Return on cracking investment increases with increasing throughput; it is greater for combination topping-cracking than for separate topping and cracking. Operating for higher octane number makes still greater return from the combination unit.

Richfield's $5,000,000 Refinery Program Taking Shape R-212

Two combination topping and cracking units will each handle 25,000 barrels of crude daily and a polymerization unit will take 6,000,000 cubic feet daily of refinery gases.

Fuel System Vapor Losses Cost Autoists $65,000,000 Yearly . . . by W. W. Scheumann R-217

Six and one-half million barrels of butane could be used in tomorrow's motor fuels, provided the carburetor and vapor saving characteristics of all cars were up to the standard of the best cars tested. Inability to handle this higher butane-content fuel costs the refiner $16,400,000, the consumer loses $65,000,000 per year from vapor losses now experienced.

"State of the Art" as Seen in the World's Current Technical Literature R-221

Properties which Affect Lubricating Oil Performance . . . by H. M. Rugg R-224

A summation of data showing relationship between volatility, viscosity index, viscosity, and other properties on performance of crankcase oils in service.

Patent Literature of Today R-228

Activities of Equipment Manufacturers R-230

vessels, tankage and any equipment where strength tests are necessary in special or periodic inspections.

The high pressure, high throughput centrifugal pump has made remarkable strides in development over a very short period. The largest pump of this type we know of is a 19-stage hot oil pump, requiring more than 1200 horsepower to drive it, handling up to 30,000 barrels of hot charge per day at pressures upward of 2000 pounds. The best offerings of the pump-maker will be seen at the exposition. It is now considered by most engineers to be the most efficient type of pump now made for many heavy-duty services.

Keeping tubes, such as those in the cracking still, clean of heavy deposits has been a major problem ever since the advent of the tube still. New engineering advances in cleaners for straight and curved tubes in stills, boilers and condensers, special designs for heat exchangers, etc., simplify and improve efficiency in maintaining refinery operations. A new improved system for removal of, for example, carbonized deposits from preheaters, after-coolers, to restore heat transfer rates to normal values helps materially to keep the plant's throughput up to standard and to conserve fuel and reduce operating costs, improve control and operating uniformity.

The chemist is busier than ever developing and proving chemicals which reduce and retard gum formation in motor fuels, prevent or inhibit oxidation deterioration in lubricants. Announcements state that this modern and very efficient method for reducing refining costs and improving storage properties and service qualities of fuels and lubricants is reporting new developments, which mark the latest steps which the refiner can adopt to boost his plant efficiency.

Operating recording and control instrumentation is the heart, brains and pilot of process operation; much of the increased advantage in yields and in uniformly higher quality of products obtained during the last two decades is the direct result of exact control of temperatures, pressures, flow rates to predetermined optimum conditions, a situation made possible only by the design ingenuity of the instrument maker and the reliability and simplicity of his products. Among the numerous new ideas to be shown this year is one by a well known instrument builder. It is a recently developed and tried system for pneumatic remote transmission for control and recording instruments, a decided innovation which promises still better plant operation, engineers say.

Pipeline Transportation, Natural Gasoline Developments

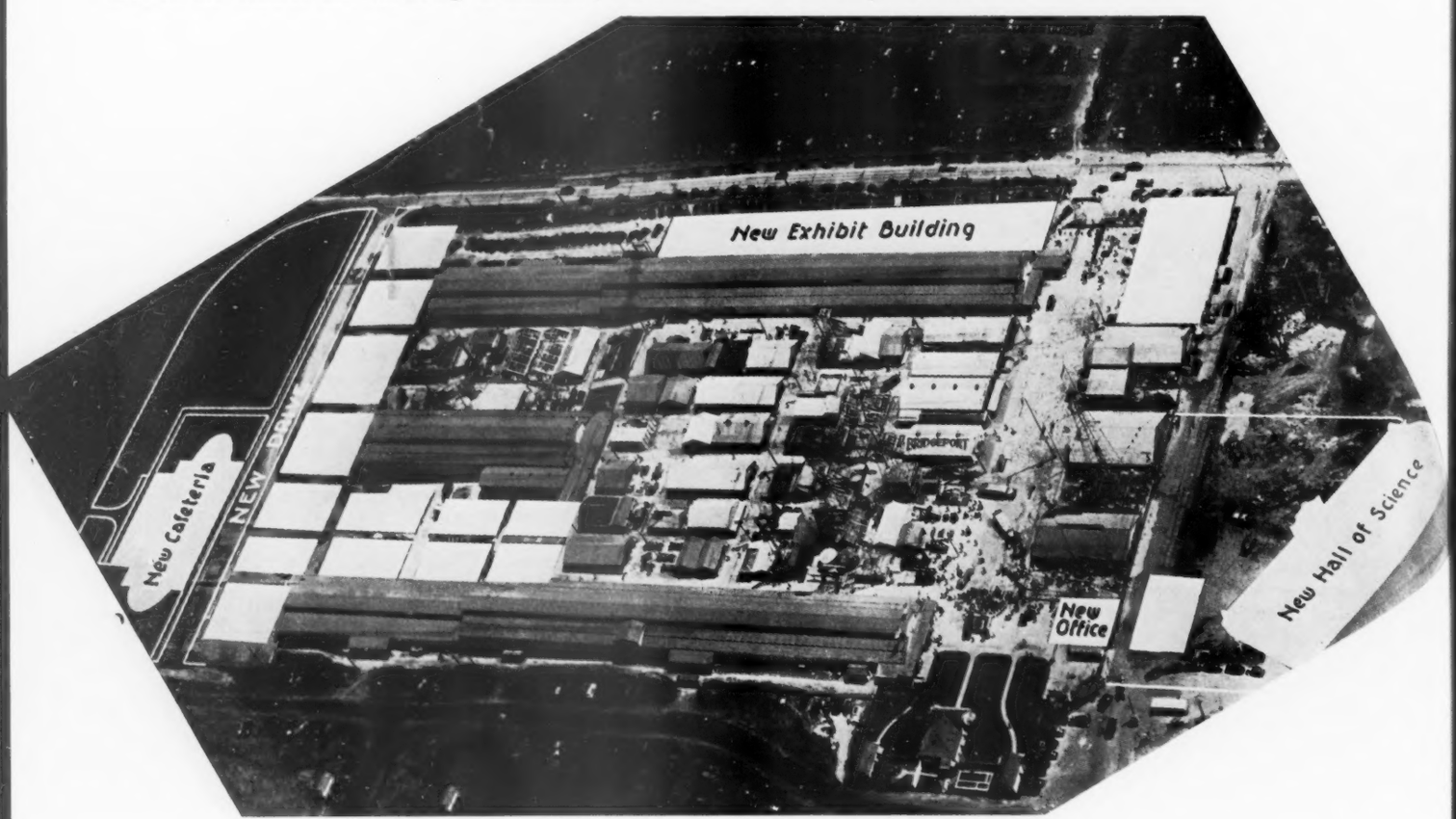
Diesel engines are progressing rapidly for refinery and oilfield power. New diesel-powered trenchers are cutting costs. Stove-pipe welding methods are being applied to small lines, and are expected soon to be used on larger and longer trunk lines.

In the natural gasoline field, a filling station for handling butane at elevated pressures will be shown and demonstrated. A liquefied gas bottling station; compressors for tank wagons handling butane; some new types of pumps and flowmeters for light products are outstanding in the exhaustive and exhausting list of advantage-making equipment. Carbon black, ordinarily hard to ship satisfactorily, is now molded into pellets and handled with a shovel in tank car loading.

Refining processes will be shown in greater numbers and more educational detail than ever. Solvent extraction and dewaxing methods will be demonstrated. Butane cracking plants are shown, polymerization processes will show what can be done with these important new methods in gasoline plant and refinery, operating on almost waste materials. Sulfur in gasoline affects lead susceptibility, storage quality and service effectiveness; processes for its removal help the refiner to handle the situation. At least five processes, and the equipment required to operate them, are displayed in detail.

In some less universally important fields will be, for example, a new carburetor for the use of butane as fuel in drilling engines. Propane as a refrigerant has made great strides since the Bureau of Mines published its first study of this field a decade or more ago.

The Exposition has been one of the important activities of the industry for many years. Engineers and executives who have watched its rise and expansion say that this year's job is by far the most complete ever accomplished by the industry. For the practical oil engineer in whatever field, the information gleaned by a careful, intelligent study of what is new and best in this Show is probably the most useful method of gaining first-hand knowledge of the last word in oil industry advances.



The white rectangles in this photograph show the new buildings added to the rapidly expanding Tulsa Oil Exposition. Of greatest interest to engineers and technologists is the new Hall of Science to the right, in which will be concentrated the best in developments in every scientific and technological field of the petroleum industry

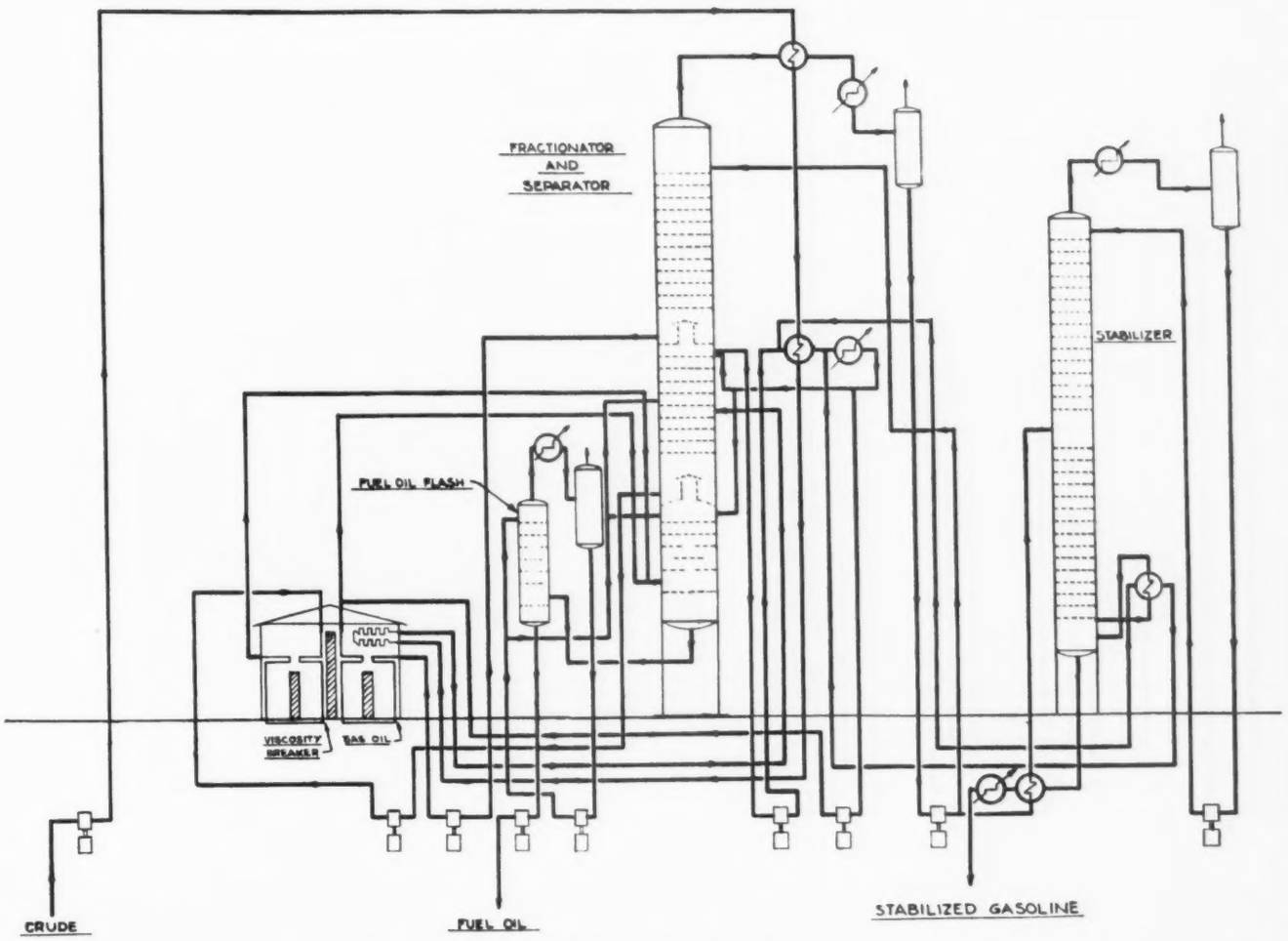


Fig. 1. Flow sheet two coil crude cracking unit

903
718

Combination Cracking Economics

(*Presented before Western Petroleum Refiners Association, Hot Springs, Ark., April 25-27.*)

By Eugene R. Smoley*

ABSTRACT

Study of all specific variables in a refiners situation is necessary when making a decision regarding installation of new cracking equipment.

It is practicable now to deliver a cracking unit in seven months and to produce specification products at full capacity on the initial run.

The accompanying curves show returns on investment under varying operating conditions and costs, on crudes costing $1.20 to $1.60 per barrel at the refinery.

A SURVEY of the literature shows that the technical aspects of modern cracking developments have been more thoroughly treated than have the economic factors involved. Since a considerable interest is being shown in the installation of modern cracking units for the production of more and higher grade gasoline it is felt that further publication of economic studies will be of value to the industry.

It should be borne in mind that such studies are of general value when made as a basis of comparison, rather than as applying specifically to any one refinery or individual set of conditions. To anyone who has attempted to evaluate the economics of a proposed modern cracking unit it is apparent that there are a large number of variables to be considered. Among the more important of these are crude, gasoline and fuel oil prices, market requirements and specifications, the cost of materials of construction and the variation of installation cost with thruput and type of plant. Also there is the relation of operating costs to location and plant thruput. Plant location introduces variables such as labor market, water and power supply which affect the direct operating costs, and in addition influence the investment cost through type of construction, and transportation facilities.

The method of attack used in the preparation of this paper is applicable to the comparison of any refinery processes or types of equipment.

Bases for Economic Studies

For the studies made in this paper, cracking of 36.9 A.P.I. Mid-Continent crude for ultimate gasoline yields was selected. These studies were made for crude thruputs from 2000 to 20,000 barrels (42 gallons) per operating day. Three

* The Lummus Co.

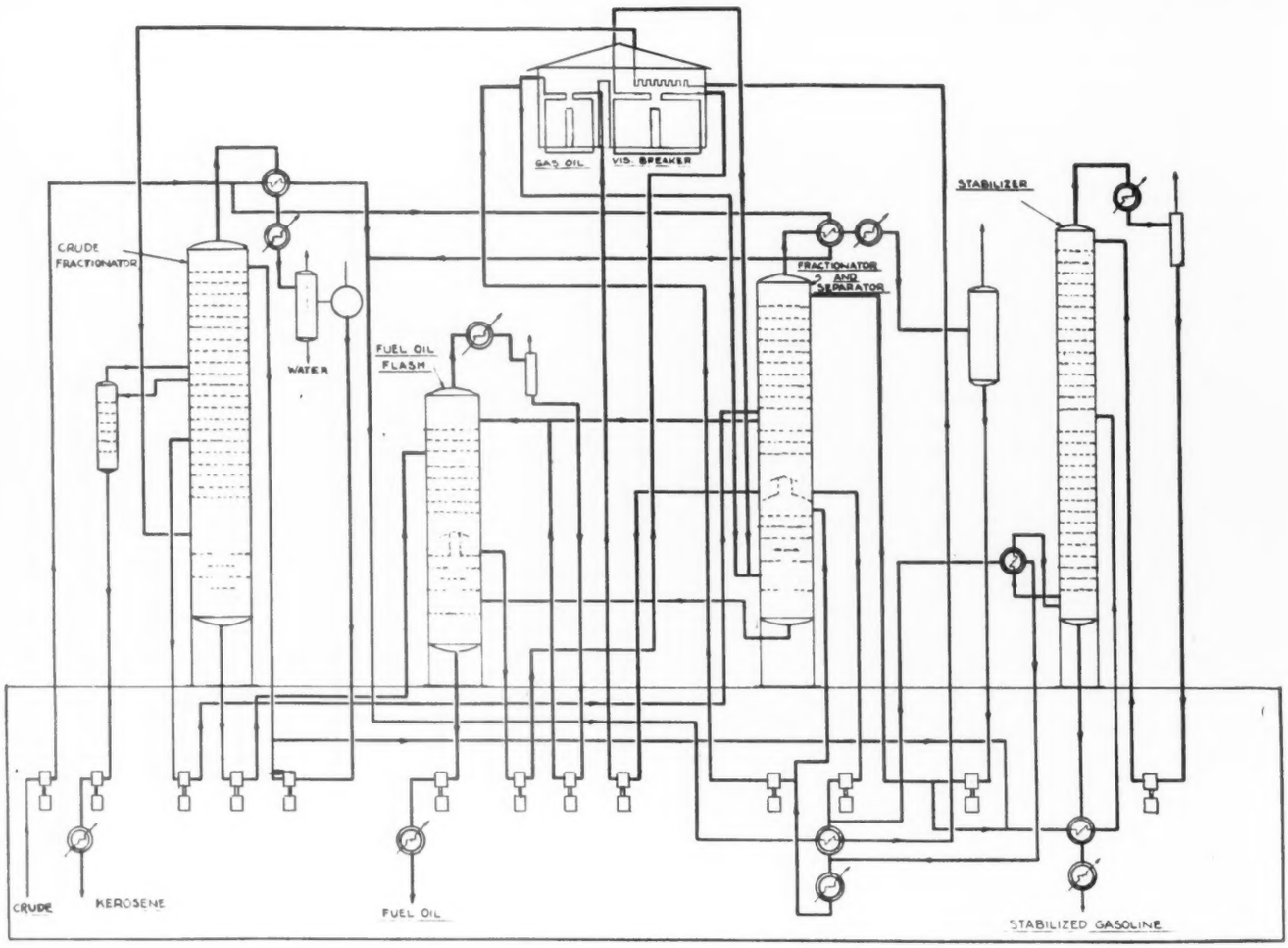


Fig. 2. Flow sheet two coil topping and cracking unit

types of units were considered. Flow sheets Figs. 1 and 2 show two of these units, Two Coil Crude Cracking and Two Coil Topping and Cracking. The third is Separate Topping and Cracking. Prices of crude were selected in the range of $1.20 to $1.60 per barrel delivered to the refinery. Gasoline prices range from 4c to 7c per gallon at the refinery, and fuel oil prices from $.60 to $1.20 per barrel. Gas produced was credited at an equivalent fuel value of 50c per barrel, or 10c per thousand cubic feet of gas. Percent return on investment was calculated on the capital expenditure for the unit itself within battery limits, neglecting tankage, utility and other auxiliary equipment. Normal royalty charges were included. A 90% service factor was used for all studies.

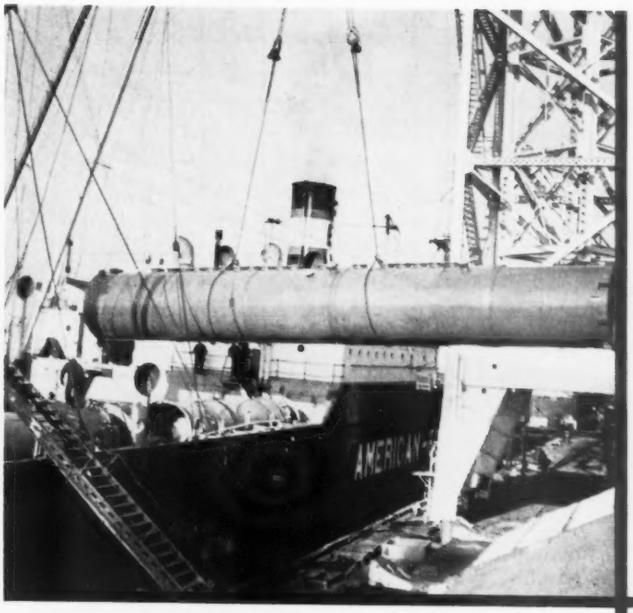
The direct operating costs as plotted in Fig. 4 in dollars per barrel of crude thruput against barrels per day crude thruput were made from values obtained from twenty-two representative operations in this country and include direct operating labor, fuel, maintenance and cleaning, steam, water, power, air and chemicals. These direct operating costs represent the actual utilities used and at the prices paid at the refinery from which they were obtained. The percentage each one of these items represented in the total direct operating cost were averaged for the twenty-two sets of data at hand and are shown in Table 2. These fall in the following order of importance: fuel, labor, utilities other than fuel, and maintenance. In Table 2 is also shown the range of unit costs of these utilities.

Fig. 1 shows the flow sheet of the Two Coil Crude Cracking Unit. The crude after receiving preheat from gasoline vapors, gas oil circulating quench stream and convection section of gas oil and viscosity breaker heater flashes in an intermediate section of the fractionator and separator tower. Visbreaker charge is removed from a pan below this point and gas oil charge from a point above. Separator bottoms are flashed to fuel oil specifications and gasoline overhead is stabilized. Because crude is flashed in the fractionator, the end point of straight run gasoline must be the same as that of the cracked gasoline and no kerosene or other straight run products can be removed.

Fig. 2 is the Two Coil Topping and Cracking Unit flow sheet. A separate crude fractionator tower permits variation in end point of straight run gasoline, and the removal of kerosene or other straight run products. In this unit the reduced crude from the topping tower picks up preheat and cycle stock in the fuel oil flash tower before going to the visbreaker furnace. The straight run gasoline is stabilized along with the cracked gasoline. Furnace oil can be withdrawn through a stripper from the fractionator tower.

Fig. 3 presents a flow sheet for the Three Coil Topping and Cracking Unit. While this was not used in the present pay off studies because reforming of Mid-Continent naphtha is not necessary, the operating costs and investment costs of this unit are presented so that economic studies could be made on other crudes requiring reformer operation.

The analysis of the direct operating costs is complicated by such varying factors as operating technique, location, feed stock character, extent of side product removal, and the supply of steam, power and water. The family of curves drawn are relative and to be used for comparison purposes. Adjustments were made to place the operating costs for the different operations on a comparable basis. There was little data to establish the low thruput end of the curves and it is here that different operations will vary more than at higher thruputs. The separate topping and cracking curve is lower than any calculations from data



Shipments

BY WATER

Our plant is not only one which is equipped with every modern facility for the production of massive, all welded pieces of refinery equipment, but it is located at the mouth of the Philadelphia Harbor with piers, large cranes and every facility for water shipments direct from our plant.

SUN

SHIPBUILDING & DRYDOCK COMPANY

CHESTER, PENNSYLVANIA

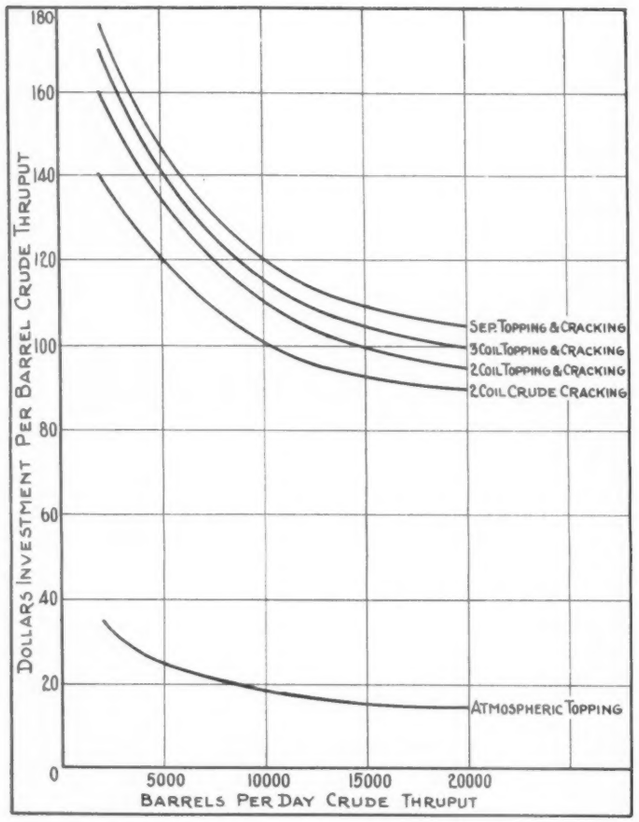

DOLLARS INVESTMENT PER BARREL CRUDE THRUPUT
BARRELS PER DAY CRUDE THRUPUT
SEP. TOPPING & CRACKING
3 COIL TOPPING & CRACKING
2 COIL TOPPING & CRACKING
2 COIL CRUDE CRACKING
ATMOSPHERIC TOPPING

Fig. 5. Investment costs

The yields of gasoline, fuel oil and gas used for these studies are given in Table 1.

Discussion of Economic Studies

The values obtained from the calculations were plotted in Figs. 6, 7, 8 and 9. The first three plots give families of curves showing the return on the investment for varying crude thruputs, crude, gasoline and fuel prices and type of plant. They show that the return on the investment increases with thruput and is greater for the two coil cracking unit than for separate topping and cracking units. It is of interest that the factors affecting the return on the investment have the following order of importance: gasoline price, crude price, investment cost, fuel oil price, operating cost and royalty.

Fig. 9 represents a study of the return possible with

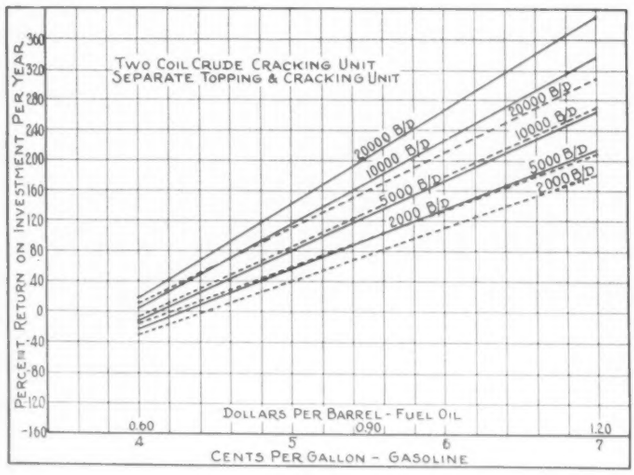

TWO COIL CRUDE CRACKING UNIT
SEPARATE TOPPING & CRACKING UNIT
PERCENT RETURN ON INVESTMENT PER YEAR
DOLLARS PER BARREL - FUEL OIL
CENTS PER GALLON - GASOLINE

Fig. 6. Return on investment using $1.20 per barrel crude delivered to refinery, in two coil crude cracking unit with separate topping and cracking unit. Investment costs from Fig. 5; direct operating costs from Fig. 4

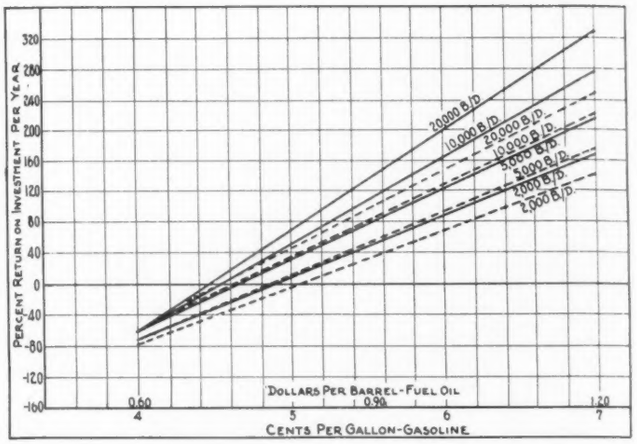


Fig. 7. Return on investment using $1.40 per barrel crude delivered to refinery, in two coil crude cracking unit with separate topping and cracking units. Investment costs from Fig. 5; direct operating costs from Fig. 4

these different types of units at various crude thruputs, taking into consideration the octane number of the finished gasoline. It will be noted that the two coil topping and cracking unit in spite of a higher investment cost has a more rapid pay off than the two coil crude cracking unit. The return on the investment is still greater when the two coil combination unit is operated for higher octane number.

In considering the possible return on the investment for a cracking unit other factors must be borne in mind. It is important that the capital invested in the equipment should become productive as rapidly as possible. The minimum time should be taken, therefore, for construction and initial operations. It is possible today to have a unit delivered in seven months and to produce specification products at full capacity on the initial run. The design and general arrangement of the unit also affects the possible return through easy operability, freedom from mechanical difficulties and maintenance of high service factor. Rapidity of turn-around is of advantage not only from the standpoint of lost stream time, but also in decreasing mechanical maintenance charges. Since the equipment will be bought with an expected life of about ten years, it is necessary for the design

TABLE 2

Average breakdown of direct operating costs

	%	Range Unit Cost
Labor	22	
Fuel	36	$0.40 to $1.00 per barrel
Maintenance and Cleaning	20	
Steam		20-35c per 1000-lb.
Power	22	0.4 to 1.25c per KW.
Water		0.3 to 0.5c per 1000 gallons
Air, Chemicals		
	100	

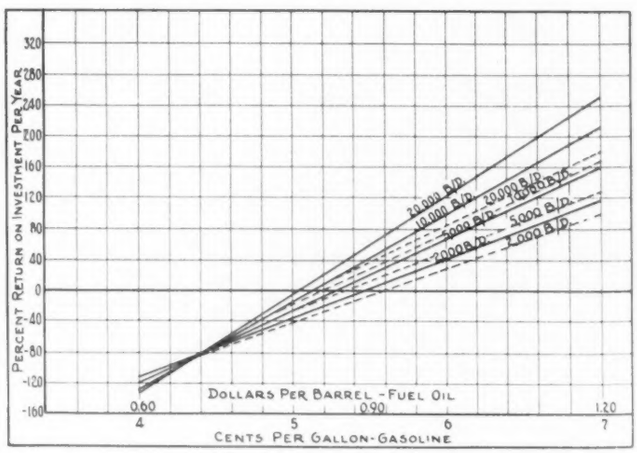


Fig. 8. Return on investment using $1.60 per barrel crude delivered to refinery, in a two coil crude cracking unit, with separate topping and cracking units. Investment costs from Fig. 5; direct operating costs from Fig. 4

TABLE 1

Yields (Volume per cent)

Mid-Continent Crude 36.9 API	Topping	Two Coil Crude Cracking (Fig. 1.) or Separate Topping and Cracking	Two Coil Topping and Cracking (Fig. 2.)	
St. Run Gasoline	33	33	26	20
Cracked Gasoline	..	36	42	45
Total Gasoline	33	69	68	65
Octane Number, CFR	47	63	66	70
Fuel Oil	..	25	25	25
Gas Oil	16	..	..	..
Reduced Crude	50	..	..	..
Gas and Loss (wt. %)	1	6	7	10
Total	100	100	100	100

points 4 to 8 and 19 to 22 for cracking plus 1 to 3 for topping would show. In spite of the fact that this gives less advantage to combination topping and cracking, it was felt that it was a fairer basis in view of the many other variables. The curves drawn because they represent averages are more uniform than would actually be found from such comparisons of specific cases.

Fig. 5 shows the investment costs in dollars per barrel of crude thruput for atmospheric topping units, for the types of combination unit shown in Figs. 1, 2 and 3 and for separate cracking and topping units, all plotted against barrels per day of crude thruput. These comparative curves are based on one type of material specifications throughout. No alloy steels or lined towers were used and the design favors simplicity and operability.

The investment cost for the separate topping and cracking units, it will be noted, is even greater than that for three coil combination topping and cracking units. While the studies were made on ultimate gasoline production, the flow sheets indicate that kerosene can be removed if desired and it is also possible to remove furnace oil by adding a stripper.

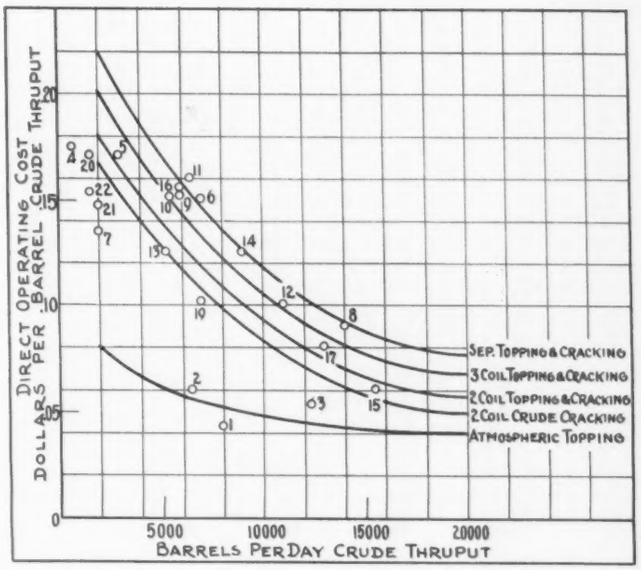


Fig. 4. Direct operating costs

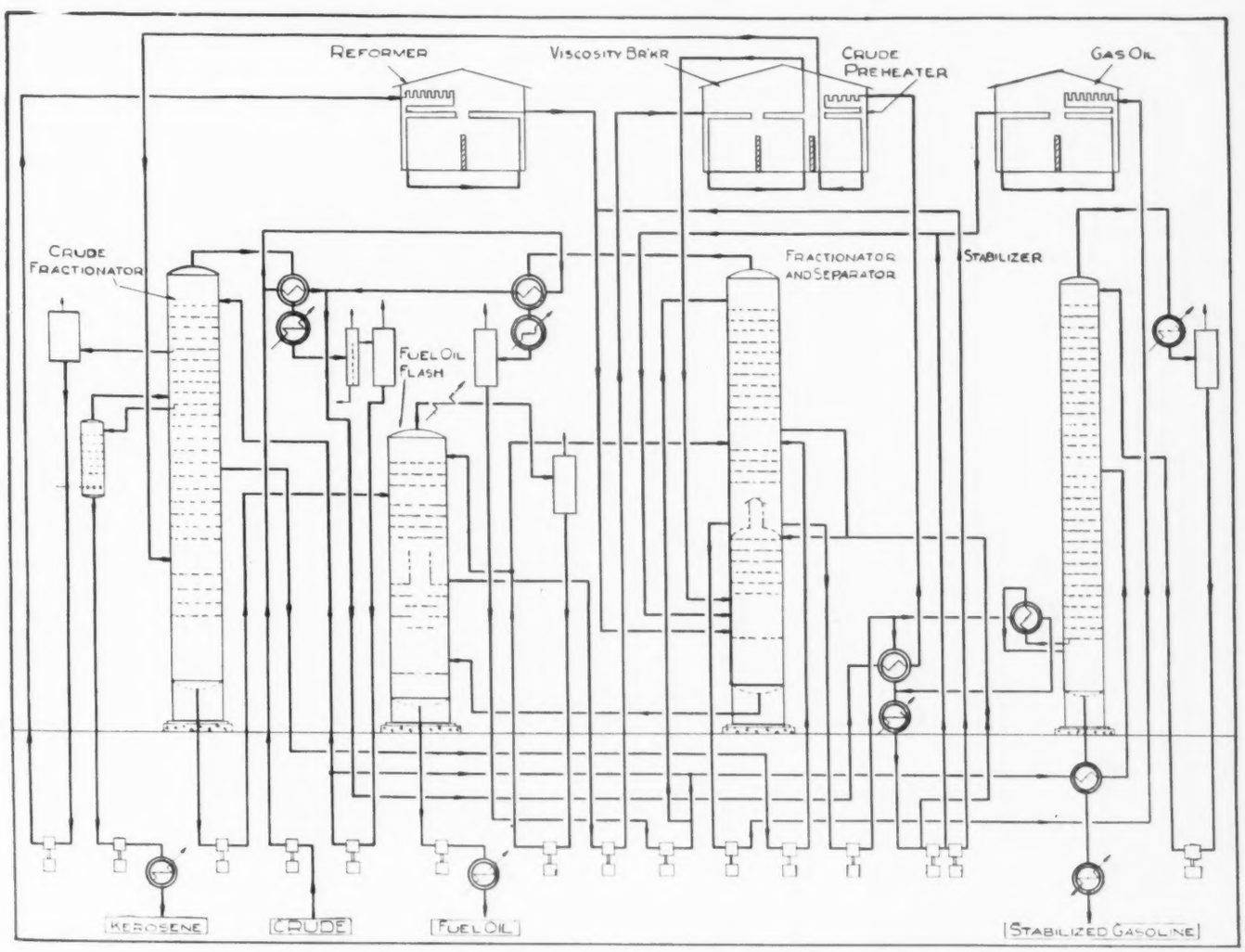


Fig. 3. Flow sheet three coil topping and cracking unit

INTRODUCED AT T

NOW-2 ye

AN INTERNATI

SUCCESS!

SEE IT IN ACTION — AT THE EXPOSITION

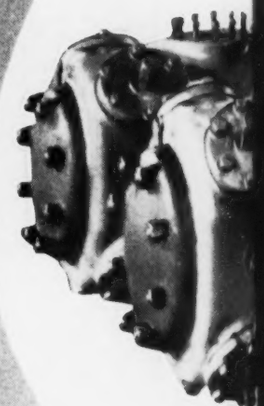
Announced and displayed for the first time at the International Petroleum Exposition of 1936,—just "between shows" the CLARK "Super-2-Angle" has advanced from a situation where it was entirely unknown, to a position of definite world leadership in its field. This unit ranks today, without a question, as the compressor sensation of the century! Not only have scores of major installations been made in this country from coast to coast, but the export demand has been exceptional, culminating recently in orders totaling three quarters of a million dollars.

The CLARK "Angle" combines the simplicity of the CLARK Super-2-Cycle Horizontal Compressor with the advantages of the CLARK Vertical Gas Engine. Its success is directly attributable to the fact that, without sacrificing either power or efficiency, it has introduced these important basic savings: (1) Shipment assembled; (2) Smaller foundations; (3) Smaller floor space and building; (4) Lower fuel consumption; (5) Lower maintenance.

Made in 2, 3, 4 and 6-cylinder sizes, ranging from 200 to 600 H.P. See this important new development without fail, at the Exposition, CLARK Building, Section U, near center of grounds.

CLARK BROS. COMPANY
Olean, New York, U.S.A.

Export Office: 30 Rockefeller Plaza, New York. Mid-continent Sales Offices and Warehouses: Tulsa, Okla., Dallas and Houston, Texas. West Coast Offices: Smith-Booth-Usher, 2001 Santa Fe Av., Los Angeles. Foreign Offices: 72 Turnmill St., E. C. 1, London, England; 4 Str. General Poetas, Bucharest, Roumania.

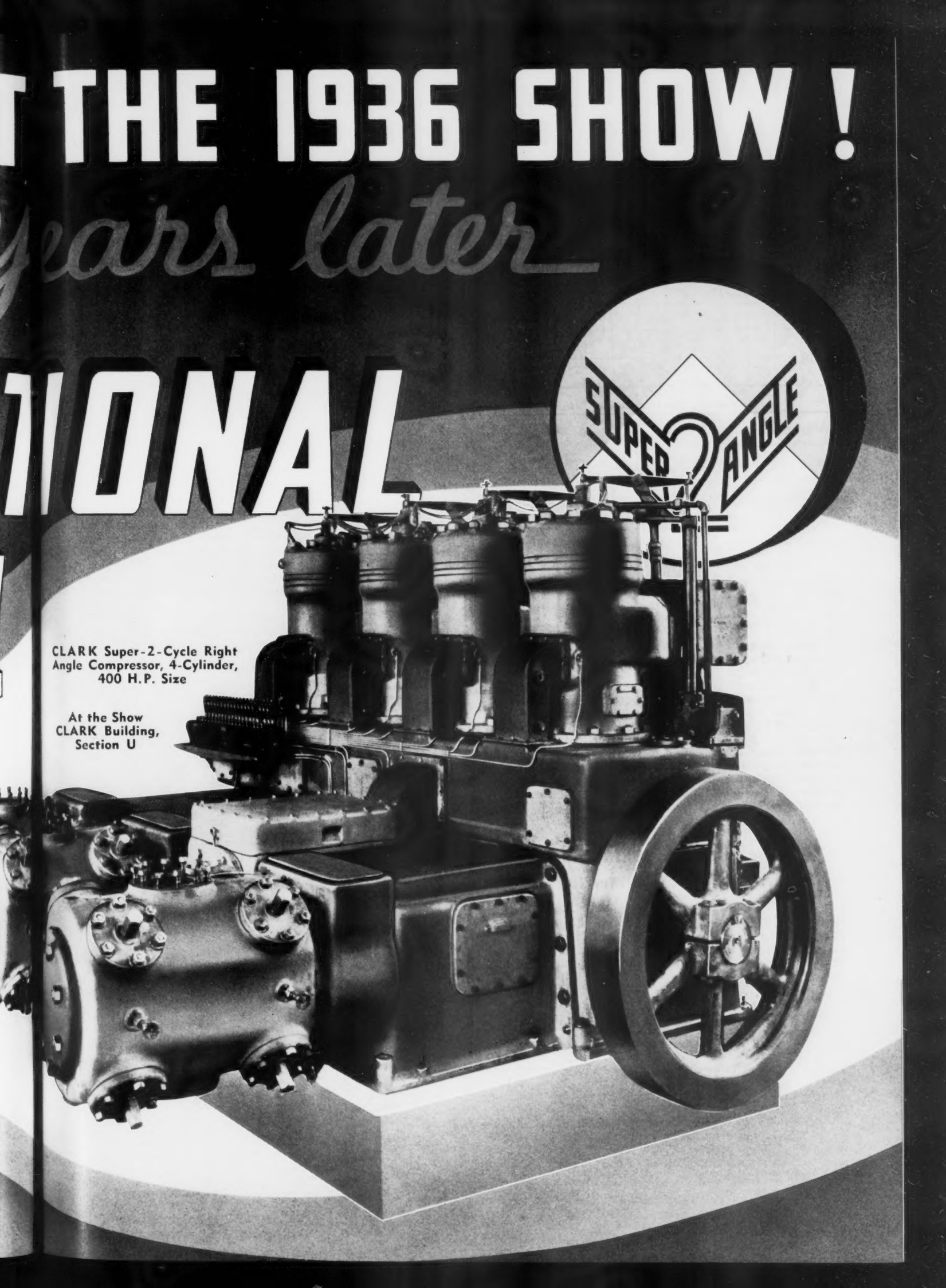


CLARK

T THE 1936 SHOW!

ears later

TIONAL



CLARK Super-2-Cycle Right Angle Compressor, 4-Cylinder, 400 H.P. Size

At the Show CLARK Building, Section U

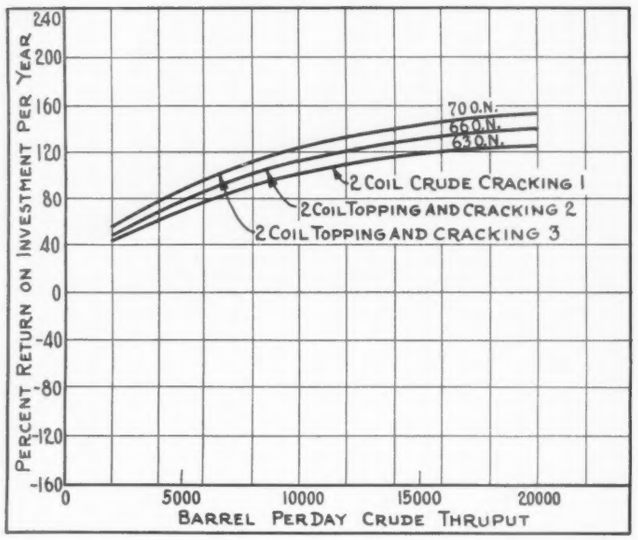


Fig. 9. Return on investment comparison operations in Figs. 1 and 2

Operation	1	2	3
YIELDS			
Gasoline	69-63 O.N	68-66 O.N	65-70 O.N.
Fuel oil	25	25	25
Gas	6	7	10
St. run removed	33	26	20

ROYALTIES ON BASIS OF ACTUAL STOCK TO COILS

63 O.N Gasoline	$.049 a gal.
66 O.N Gasoline	$.051 a gal.
70 O.N Gasoline	$.055 a gal.

Fuel oil $.90 per barrel; crude price $1.20 per barrel delivered to refinery. Investment costs see Fig. 5; operating costs (operation 3 operating costs taken as 1 cent more than operation 2, and service factor 0.88 versus 0.90 for operation 2)

to incorporate sufficient flexibility to permit changing crudes or adjusting products to a wide range of possible future requirements.

From the average relationships derived in this paper it appears that the refiner who is contemplating the installation of new cracking equipment will profit by a thorough study of all the specific variables which apply to his refinery and which enter into the establishment of optimum return. Refiners willing to increase somewhat their investment for new cracking equipment will be interested in the economics of combination processes for increasing yields of overall gasoline production with accompanying octane increase to the range of 74 to 80.

Impact Testing Will Feature Annual A.S.T.M. Meeting

At the forty-first annual meeting of the American Society for Testing Materials in Atlantic City, June 27 to July 1, studies in the oxidation of mineral transformer oil and an accelerated test for determining chemical stability of lubricating greases will be covered in the field of petroleum.

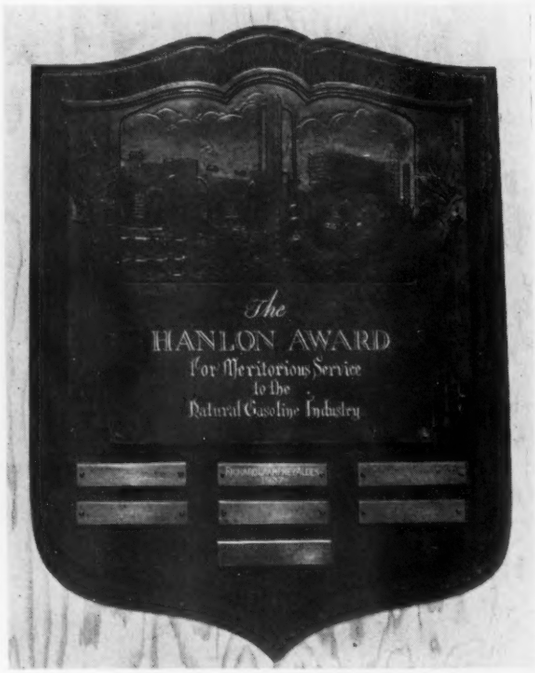
The main feature of the meeting is a symposium on impact testing. It is intended to explain why the impact test is used, what it measures, and what is its value. Broadly it will be a review of present knowledge of impact failures and methods of test.

Another session will be devoted to water for industrial use. Topics to be covered include embrittlement testing of boiler waters, methods for determining dissolved oxygen and sodium, and methods of removing dissolved salts.

Some papers covering the properties of metals as affected by temperature and fatigue are scheduled. Some of these will cover problems of the relation of actual grain size to creep strength and effects of elevated temperatures on fatigue properties.

Prof. V. I. Komarewsky, member of the research staff of Universal Oil Products Co., is giving two courses at Armour Institute of Technology. A course on catalysts in chemical reactions consists in discussions of such processes as hydrogenation, dehydration, polymerization, isomerization, and alkylation. In the course on chemistry of motor fuel, different sources are discussed, motor fuel properties are defined, and different processes of production are covered.

Two Fellowships in connection with these courses are being supported by Universal Oil Products Co., one for the Master's degree and one for the Doctor's degree.



The Hanlon Award is the plaque awarded annually by the Natural Gasoline Association of America to the technologist whose contributions to the natural gasoline industry is voted the most outstanding during the immediate past. In 1937, the first time it was awarded, R. C. Alden internationally known technologist and director of research of Phillips Petroleum Co., was the recipient of the award. The second award of this honor will be made by the Association at its May, 1938, annual meeting in Tulsa

CRANE CAST STEEL VALVES

See Our Exhibit
INTERNATIONAL PETROLEUM EXPOSITION
TULSA
MAY. 14-21

The Crane No. 24-S carbon cast steel valve for 400 pounds W. O. G.

FOR GENERAL PRODUCTION SERVICE

The Crane No. 24-S carbon cast steel valve is a competent oil country workman for places where safety and uninterrupted service are all-important. Use it for working pressures up to 400 pounds W. O. G.—non-shock. It's the ideal valve for flow lines and manifolds on low pressure wells—and a handy all-around valve of moderate cost for all sorts of oil country production service.

You can rely on the inside quality of the No. 24-S for more economical valve performance in any service for which it is suited. It's Crane designed and Crane engineered—backed by a valve-building experience of more than 80 years.

The Crane 24-S is trimmed to give better service in corrosive spots—with its disc of nickel-chrome alloy cast steel, cast manganese bronze disc bushing, and seat rings of Crane Exelloy. The non-rising stem is of Crane Triplex steel, nickel plated, with a tensile strength of 130,000 pounds minimum.

For service beyond the 400-pound rating of the No. 24-S, the Crane line offers cast steel flow line or manifold valves for pressures up to 3000 pounds. Get acquainted with this famous valve family. Know the real meaning of "It's what's inside that counts."

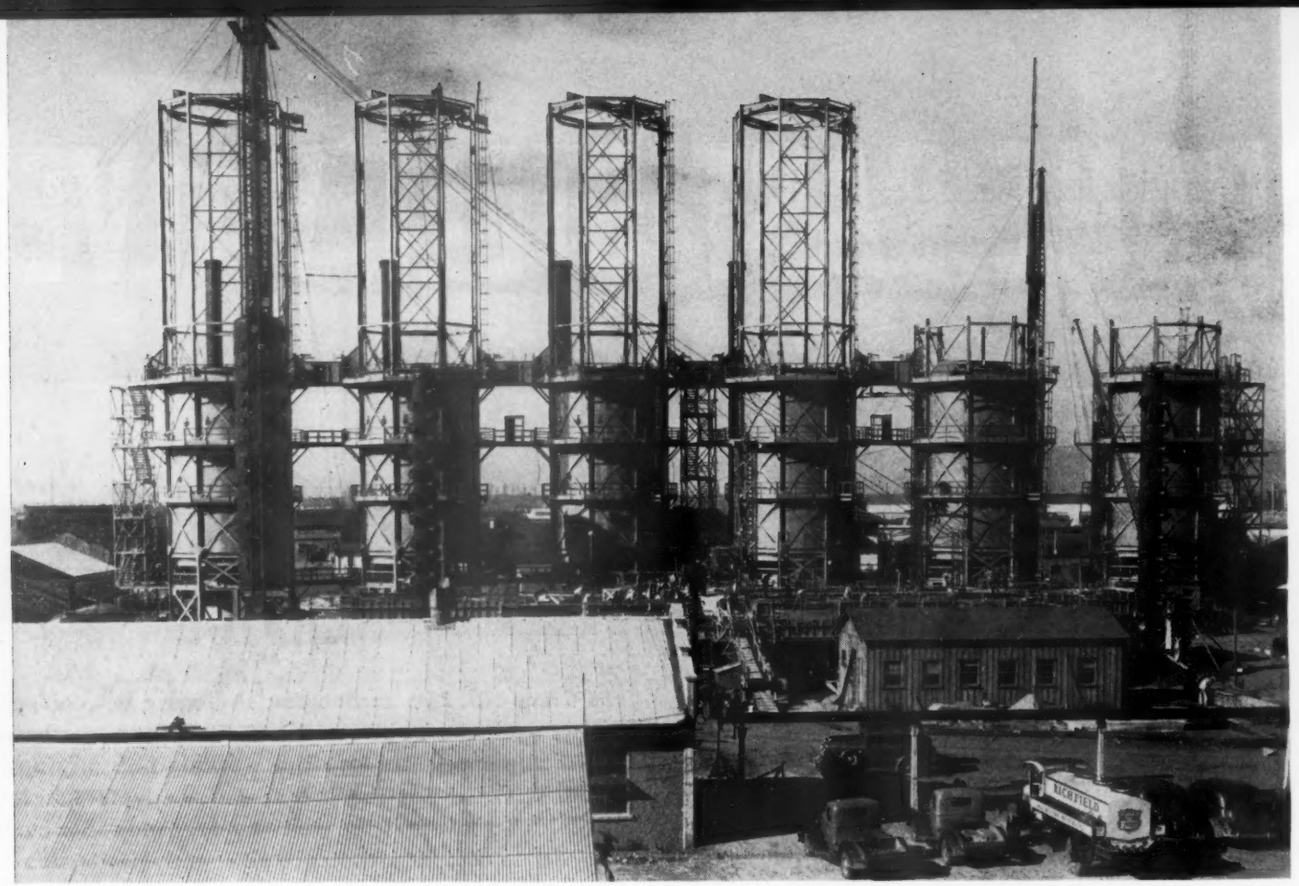
CRANE

VALVES · FITTINGS · PIPE
PLUMBING · HEATING · PUMPS

CRANE CO., GENERAL OFFICES: 836 SOUTH MICHIGAN AVENUE, CHICAGO

NATION-WIDE SERVICE THROUGH 134 BRANCHES
AND MORE THAN 500 WHOLESALERS

IT'S WHAT'S INSIDE THAT COUNTS!



These six vertical DeFlorez heaters under construction at Watson, Cal., are the largest ever built on the Pacific coast. Their height is 132 feet and diameter is 30 feet. Pump-house and control rooms are being built in front of the heaters

721.3

Richfield's $5,000,000 Refinery Program Taking Shape

A short description of the new refining facilities of Richfield Oil Corp. to be completed before fall is given here along with a progress report of the present construction work.

By J. N. WESTSMITH
N. P. N. Staff Writer

AT WATSON JUNCTION, near the Los Angeles harbor area, Richfield Oil Corp.'s $5,000,000 construction and modernization of refining facilities is reaching the stage where general details are beginning to take shape.

Scheduled to be placed in operation during the late summer of 1938, the new additions include two combination topping and cracking units, each to have an estimated daily capacity of 25,000 barrels, a gasoline treating and finishing plant, and a polymerization unit designed to handle 6,000,000 cubic feet of refinery tail gases daily.

Going about as far in instrumentation—air and electric actuated—as they can, Sinclair engineers in charge of design for the entire program have pointed for a flexibility of operation which will permit processing of the wide range of California crudes, including the comparatively viscous high sulfur oil found in certain sections.

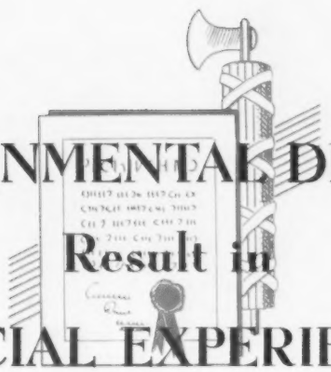
In this respect, fittings, linings and tubes subjected to corrosive oil under high temperatures and pressures will receive special emphasis in the construction and will be protected by corrosion resisting alloy steels.

Accompanying photographs illustrate the progress made up to mid-April on the new building program. Erection of the eight furnaces, six DeFlorez vertical tube downfires type and two Alcorn double-fired horizontal tube type, is well under way.

Each of the new combination topping and cracking units will have a battery of four heaters—three of the vertical tube type and one horizontal. Each group will be designed to yield 300,000,000 Btu's. an hour. Standing 132 feet high and having a diameter of 30 feet, the vertical tube heaters are the largest ever built on the Pacific coast.

Capacity of the heaters is 25,000 barrels daily per combination unit. Maximum uniform temperature expected from the furnaces is placed at 1500° F.

Crude charging stock to either of the combination units will first be pumped through a system of heat exchangers where its temperature will be raised by hot streams from



GOVERNMENTAL DECREES Result in SPECIAL EXPERIENCE

In some countries, the law sets a minimum ratio between native and imported labor used on the construction and operation of projects by "foreign" corporations. Under such conditions it is usually more economical to operate on a large scale...to set the per man output as high as possible...to employ automatic control equipment to the fullest extent.

Badger Engineers who have designed all kinds of oil refining projects and erected them in many different countries know this problem of balancing output with labor requirements. This same experience is valuable also to buyers of engineering and construction in countries that do not have such regulations.

E. B. BADGER & SONS CO.

BOSTON • NEW YORK • SAN FRANCISCO

Engineers and Contractors
for Petroleum Distillation and Refinery Equipment

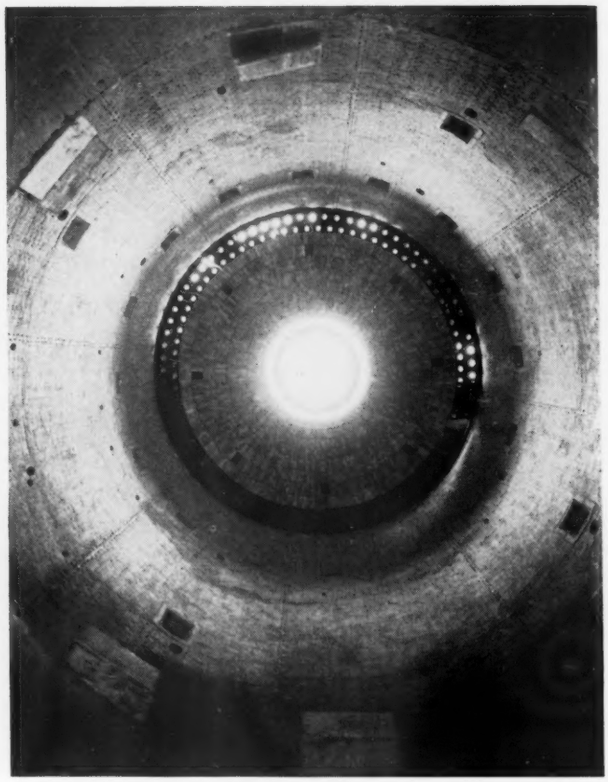
Cement foundations for the six DeFlorez heaters being erected give an idea of the immense proportions of the completed refinery

the fractionating towers. From here it goes to the horizontal tube furnace.

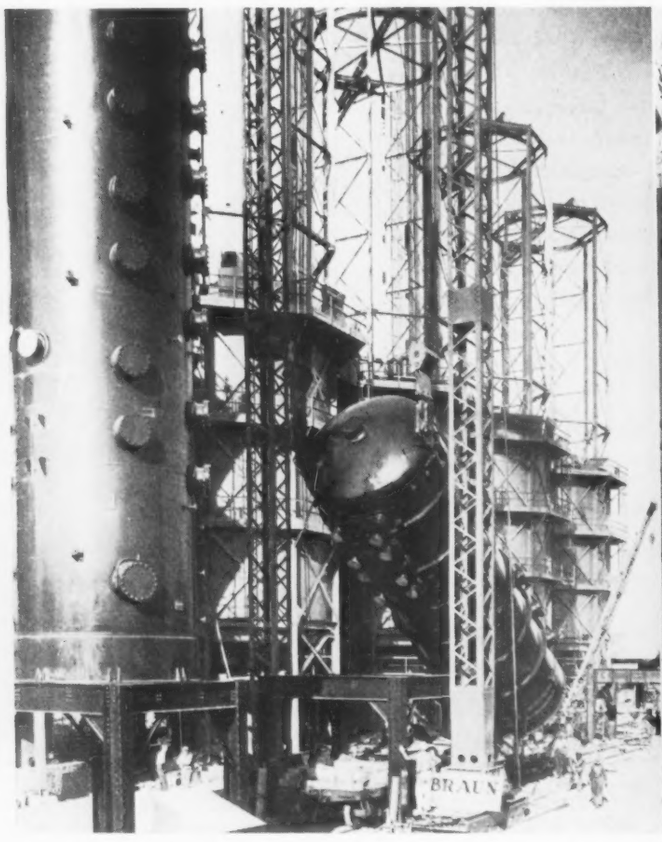
Designed for double firing, one side of these heaters will be used for crude while the other is reducing crude returning from the flash towers. Each side of the heater will consist of a radiant heating section surrounded by carbon-steel tubes. Gases from both sides discharge into a common down-draft convection section where they pass around the convection tubes.

Crudes entering the furnace will pass upward through a bank of the convection tubes and into the radiant tubes. Heat transmitted to the crude in the furnace will vary from 3,500,000 to 20,000,000 Btu's. per hour depending upon cleanliness of the heat exchangers.

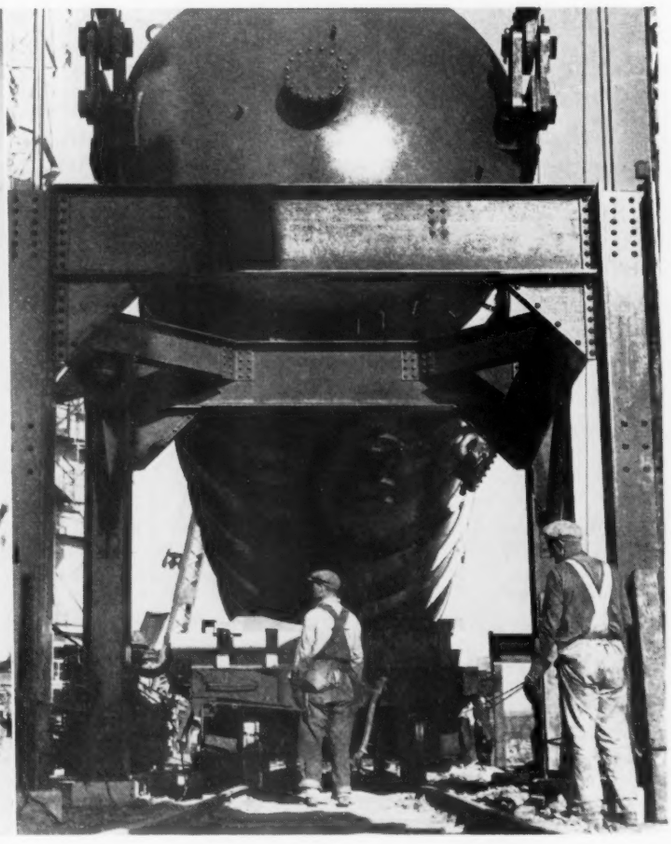
It is pointed out that when the exchangers become dirty, the furnace fuel consumption will increase, but the outlet temperature will be automatically regulated at 625°



Worm's-eye view inside one of the DeFlorez heaters. Temperature inside this furnace will be 1500° F.



A 135,000-pound vacuum evaporator is being hoisted into place alongside the 170,000-pound crude tower which was erected in the same fashion as a part of Richfield's new $5,000,000 refinery at Watson, Cal.



Some idea of the proportions of the 135,000-pound evaporator is afforded by this view as it starts to leave the flat car. Note the rail depressions under the car wheels

"THIS CLUB WILL GET YOU OVER THE TRAPS"

NO need to fall short because of excessive refining costs if you stabilize cracked gasoline with du Pont Gasoline Antioxidants.

And here's why it costs less: Du Pont Gasoline Antioxidants prevent gum formation . . . and in many cases eliminate the need for redistillation . . . reduce color loss . . . maintain anti-knock quality. Maintenance and replacement costs are lower because your valuable equipment is not exposed to the corrosive action of strong acid.

Surprising how little it takes . . . surprising how little it costs to protect your product and your profits by this modern method. Many refiners report bigger profits since they started using du Pont Gasoline Antioxidants.

Write for further information about these money-saving features. E. I. du Pont de Nemours & Co., Inc., Organic Chemicals Department, Wilmington, Delaware.

DU PONT
REG. U. S. PAT. OFF.

GASOLINE ANTIOXIDANTS

F. At this temperature the crude will pass to the flash towers where the straight-run gasoline will be removed.

Reduced crude returns from the flash towers to the horizontal tube furnace and enters the constant-load side through a bank of convection tubes. Here 25,000,000 Btu's. per hour will be transmitted to the charge and the outlet temperature of the reduced crude will be built up to 670° F.

A uniform temperature of about 1000° F. will be maintained in the vertical tube furnaces to induce cracking. The use of three of these units in each cracking plant will permit practically any recycling ratio to be obtained.

The construction calls for seven separating and fractionating towers for each combination unit. The largest of these will be roughly 13 feet in diameter and 60 feet high containing 19 bubble cap trays.

Weighing from 100 to 125 tons each, the largest of these bubble towers has taxed available transportation facilities.

In addition to the new construction work, Richfield is modernizing the existing crude distillation units, inherited from Pan American Petroleum Co. many years ago. It is proposed to completely overhaul and modernize one 10,000-barrel crude unit by addition of new heat exchange and fractionating equipment.

When completed, the improvements will give the unit a capacity of 14,000 to 19,000 barrels of crude oil daily, depending upon the type of crude to be run. Another of the existing crude distillation units was converted into re-run equipment.

Use No Steam in Pumping Santa Maria Crude

Overall cost of two new gas-engine-drive pump stations employed by Union Oil Co. of California to supply heavy crude from the Santa Maria field to the Avila ship terminal, 30 miles away, is expected to be lower than that of customary steam operated plants of comparable size and service, according to Fritz Karge, transportation engineer. The Santa Maria oil is of 15-16° API gravity and very viscous (21,000 SSU at 60° F.). Gasoline content is only 21% and the remainder is largely asphalt which is produced at 80-90° F. Direct fired heaters are employed at the two stations to make the movement possible.

Main reason for choosing direct fired heaters and gas engines is unsatisfactory water conditions. At Summit, location of the midway pump station, water supply is insufficient for steam operation. At the field, excessive chemical treatment would be required because of the very hard water. On the other hand, dry natural gas of about 1000 Btu. per cubic foot is available at both locations at an economic rate.

The heater resembles a tube still and is proportioned for burning the heated crude as fuel although combination burners are installed so that gas may be burned as well. Since the field production is lower than is desirable for satisfactory pumping, crude must be accumulated for intermittent batch pumping and in this manner loses 20-30 degrees of heat. Heater capacity is 23,000,000 Btu. per hour, maximum, which enables heating 800-1000 barrels of crude per hour to 225-275° F., depending upon atmospheric temperature.

Vaporization of gasoline content of the crude requires the use of booster pumps to force hot oil into the suction of the main line pumps under sufficient pressure to prevent vaporization at the pumping temperature. A gear type rotary pump is employed in this capacity and although 12 pounds per square inch is enough to prevent this vaporization, a suction pressure of 100 pounds was decided upon with the additional object of keeping the gas engine piston speed and brake mean effective pressure at safe values.

Gas engines are 9 x 11-inch, 8-cylinder, 4-cycle units driving 4-inch, 6-stage centrifugal main-line pumps. In heating the oil the viscosity is reduced sufficiently to be handled without great reduction in volumetric and head capacity nor in efficiency. The centrifugal also has the advantage of plugging out a cold line easier than reciprocating pumps with a pulsating impulse. Following each period of pumping, the pipeline must be cleared. Sufficient light oil of 24° API gravity is passed through the line immediately after a movement of heavy oil is completed to fill the whole line. Large expenditure for a new line was avoided by overhauling an existing 8-inch line from the Orcutt oil field, six miles distant, to Avila, and only 2¼ miles of new pipeline had to be laid.

One of the most satisfactory operating features of the stations, Mr. Karge states, is the facility and certainty with which the oil can be brought to any desired temperature. The ease with which the operators became familiar with the equipment was gratifying as well as their general opinion that these new plants are easier to operate than steam pump stations.

Develop Correction Factors For Crude Oil Meters

Positive displacement oil meters can be used for measuring crude oil in the field and elsewhere, it is shown in a newly issued Report of Investigations (R. I. 3396) by R. E. Heithecker and W. B. Berwald, Bartlesville engineers of the Bureau of Mines. Correction of errors caused by the liberation of gas from gas-saturated oil is accomplished by applying a factor which should be determined in the laboratory in a manner similar to that described in the report.

Data resulting from the calibration tests is applicable especially to meter installations that measure gas-saturated oil from an oil-gas separator where the meter may be some distance from the separator and where the meter is not equipped with an air or gas eliminator. The Bureau's calibration work shows that errors may be large where a large pressure drop occurs upstream from the meter and that the error is proportional to the amount of gas liberated from solution at the reduced pressure. Some separators are equipped with quick-opening, gas-actuated dump valves in which the oil is discharged from the separator at high velocity, and there is a resultant drop of pressure upstream from the meter.

Two different types of calibration tests are discussed in the report, the first for accuracy with "dead oil" and the second to determine errors resulting with gas-saturated oil. Laboratory analyses of this oil were made to determine the shrinkage resulting from liberation of dissolved gas by a reduction of pressure from the operating separator pressure to atmospheric pressure, thus to determine a factor for correcting the volume of the gas-saturated oil to the residual oil volume delivered to the stock tanks. The tests also determined the quantity of gas liberated from solution for different pressure drops to atmospheric pressure. Tests were made with a 1-inch meter.

The report was read before the Oil-Metering Conference at Norman, Okla., April 7-8, 1938. It is available from the Washington office of the Bureau of Mines.

F. W. L. Tydeman, director of research, Shell Development Co., left San Francisco April 20 for Europe and does not expect to return until the end of July.

Fuel System Vapor Losses Cost Autoists $65,000,000 Yearly

(Presented before Western Petroleum Refiners Ass'n., Hot Springs, Ark., April 25-27, 1938, under the title, "Economic Aspects of the Pawhuska Road Tests".)

By W. W. Scheumann*

ABSTRACT

An annual fuel loss of 1.96% from the automobile fuel system costs the American consumer $65,000,000 per year. These losses from rear tanks and carburetor vents, the latter used to prevent vapor lock in carburetors operating at needlessly high temperatures, during hot weather will range from 4% to 7% and even higher; the 1.96% is a very conservative yearly estimate.

Making all fuel systems the equal of the best in vapor saving characteristics will permit additional butane to be used, equal to 1.226% of annal requirements, saving $16,000,000, and a reduction in lead requirements of $1,800,000 per year, this author estimates.

THE choice of petroleum fractions which can be successfully included in motor fuels is governed by numerous factors. One of the most important of these is the operating characteristics of the motor vehicle fuel systems. Information concerning the behavior of automobile fuel systems in service is rather meager, and in order to study this factor, there was sponsored jointly by the Western Petroleum Refiners Association, and the Natural Gasoline Association of America, during the summer of 1937, an investigation of the performance of fuel systems of representative 1937 model automobiles. Tests were made, over a period of three months, on nine 1937 model cars which were driven approximately 10,000 miles over a selected course, in the vicinity of Pawhuska, Oklahoma.

The tests were made by a full-time group of investigators, headed by Mr. R. R. Couch, under the direction of a steering committee composed of representatives from the two above named organizations. As defined by this committee, the project was carried out with a threefold purpose in view, namely, (1) to make a critical study of existing road test procedures in order to determine their limitations; (2) to improve upon existing methods and develop better road-test procedures for the measurement of permissible vapor pressures, volumetric losses, and quality deteriorations of fuel; and (3) to obtain as complete information as possible on the fuel system characteristics of representative 1937 model automobiles.

The test procedures employed in this work for the measurement of permissible vapor pressures, vapor loss, and octane number loss, have been described in detail by Legatski and Couch[1] in a paper on this work presented before the 18th Annual Meeting of the American Petroleum Institute. For this reason only a brief mention of them will be made in this discussion. Vapor lock tests were made in accordance with the A. P. I. tentative 1937 road test procedure at 55 miles per hour. This consisted of determining by trial the highest vapor pressure gasoline which would permit a car to be started and accelerated to 55 miles per hour after a five minute stop at the end of an extended period of driving at constant speed. Fuel samples were withdrawn from the tank for test after each observation. Three alternative types of fuel handling equipment were studied.

Vapor losses were determined by means of a calibrated density variation method, from measurements made on samples taken from the car tank and carburetor bowl over a 30 mile driving distance.

Octane number losses were related to vapor losses from data secured in the development of the density method for vapor losses.

The test results obtained in this investigation were also given in part by the previously mentioned writers. However, they will be repeated here, in part, to an extent sufficient for purposes of discussing (1) the economic meaning of these results to the refining industry, and (2) the economic meaning of these results to the motoring public.

Importance of the Pawhuska Road Tests to the Refining Industry

a. Permissible Vapor Pressures.

In considering the data on maximum permissible vapor pressures, it should be kept in mind that these values are for extreme conditions, and that under normal driving conditions a somewhat higher vapor pressure fuel can be handled. In addition, these results are based on the fuel in the tank after vapor lock has occurred, and, therefore, are not necessarily indicative of vapor pressures permitted for fuels at the service station, or the refinery. These results, however, do compare fuel systems in various makes of cars, and are indicative of the differences which exist in such systems.

The test results, using the standard reference fuels, are shown in Table 1.

Table 1

Maximum Permissible Reid Vapor Pressures

Car Designation	Atmospheric Temperature °F. 80	90	100	Slope of V. P.-Temp. Curve
A	12.23	10.62	9.04	0.158
B	11.38	10.15	8.96	0.119
B'	11.42	9.10	6.82	0.228
C	12.00	10.12	8.92	0.120
D	....	9.30	7.70	0.160
E	10.87	8.82	6.80	0.202
F	....	9.27	7.93	0.134
G	11.47	9.90	8.35	0.155
H	....	10.01	8.20	0.181

In order to discuss these results in terms of their significance to the refiner, consideration will be limited to a comparison of the car showing the highest permissible vapor pressure for a given temperature, which is car A, with the car showing the lowest permissible vapor pressure, which is car E.

A major premise of this discussion is the statement that the refinery must, and is building fuels for the poorest car from this standpoint. Therefore, if the poorest car were improved to equal the best the refiner could

* Cities Service Oil Co., Tulsa, Okla.; member Western Petroleum Refiners Association—Natural Gasoline Association of America, Road Test Steering Committee.

take advantage of the ability of such cars to handle higher vapor pressure fuels, and could include a corresponding increased amount of butane in his product.

Table 2 indicates the difference in butane content of the maximum vapor pressure fuels which can be handled by cars A and E, at various atmospheric temperatures.

TABLE 2

Butane Content Related to Vapor Pressure of Fuel

Atmospheric Temp. °F.	Maximum Vapor Pressure Car A	Car E	Butane Content of Fuel—% Car A	Car E	Difference in Butane Content— %
Below 60	....	....	no difference		...
60	15.39*	14.91*	11.20	10.60	0.60
70	13.81*	12.89*	9.30	8.20	1.10
80	12.23	10.87	7.40	3.80	1.60
90	10.62	8.82	5.48	3.33	2.15
100	9.04	6.80	3.60	0.95	2.65
110	8.46*	4.78*	2.90	...	2.90

* Extrapolated Value.

In order to convert the differences in possible butane contents into motor fuel volumes, it is necessary to estimate the ratio of fuel requirements at various atmospheric temperatures. Such a break up of motor fuel requirements has been calculated, based on daily average maximum temperatures over a year's period by states, as shown in the Atlas of American Agriculture[2], and the gasoline volumes sold in various states by months, as shown in the A. P. I. statistical bulletins.

Using this basis of calculation, Table 3 shows the volumes of butane which could be included in motor fuels, if instead of building them for a car as poor as Car E with respect to permissible vapor pressures, they could be built for a car as good as Car A. This table is calculated on a basis of 525,000,000 bbls. total annual motor fuel requirement.

TABLE 3

Estimated Conversion of Butane to Motor Fuel

Average Daily Maximum Temp.—°F.	Per Cent Annual Fuel Requirement	Possible Increased Butane Utilization Per Cent	Bbls.
Below 60*	20.19	none	none
60	14.68	0.60	462,420
70	15.53	1.10	896,855
80	23.31	1.60	1,958,040
90	20.66	2.15	2,331,998
100	5.25	2.65	730,406
110	0.38	2.90	57,855
		Total	6,437,574

This amounts to an average of 1.226% additional butane in motor fuel.

The value of this increased utilization of butane to the refiner may be calculated in various manners. In a study of butane availability made by Alden[3], it is stated that there are approximatly 62,500,000 barrels of butane per year, which are available for but unused in motor fuel. (This does not include the butane content of unprocessed natural gas.) Therefore the increased amount of butane which could be used as motor fuel is probably now only valued at the price of fuel gas. If we take this to be $0.10 per 1,000 cu. ft. and the refinery price of gasoline as $0.055 per gallon, then the increased value of this butane as motor fuel nets to the refiner $16,400,000.00 annually.

If calculated on a crude oil basis, assuming a 50% gasoline yield from crude, the increased use of 6,400,000 barrels of butane as motor fuel reduces crude requirements 12,800,000 barrels which at $1.15 per barrel shows approximately the same net saving to the refining industry.

A second factor which merits consideration is the effect of this additional butane on lead requirements in the finished motor fuel. The average blending value of butanes is from 90 to 92 octane number. Considering 70% of the motor fuel ethylized with an average lead content of 0.65 cc. per gallon, it may be calculated that the use of this additional butane would result in a savings for ethylizing expense for the same octane number product, of $1,862,000.00 annually.

Therefore, from solely the standpoint of permissible vapor pressures, the petroleum industry would realize potentially in the neighborhood of $18,000,000.00 annually if the fuel system of the poorest car were improved to the point of equalling the best.

b. Fuel Losses.

It has been common knowledge for some time that a portion of the fuel is lost from the automobile fuel tank through the vaporization of light ends from the tank itself. In recent years, however, a second source of fuel loss has also become increasingly important, although it has received little mention. This is the fuel loss from the carburetor. In an attempt to minimize vapor lock, some car builders have worked toward lower fuel line temperatures by means of location, insulation, or other methods. Other manufacturers, however, have stressed increased vapor handling capacity of the fuel system and the venting of carburetors, so that the fuel system can handle considerable amounts of vapor which is vented to the atmosphere when it reaches the carburetor. This loss of fuel from the rear tank and the carburetor was also investigated as a part of the Pawhuska Tests, in order to obtain information regarding the volumes of such losses and the effect of these losses on the degradation of fuel quality.

Exhaustive measurements were made only on two cars. On these cars losses were measured on the car tank and carburetor bowl liquid, over a range of atmospheric temperatures, using standard reference fuels over a range of vapor pressures. It was found that a fairly close relationship existed between the vapor pressure of the fuel in the car tank, the carburetor bowl temperature, and the observed volumetric loss of fuel. This enabled probable vapor losses to be calculated for all the cars on which temperature measurements had been made. The results of such calculations are shown in Table 4.

TABLE 4

Probable Vapor Losses for Conditions of Steady Driving At 55 Miles per Hour-Volume Per Cent

Car	Atmospheric Temp. °F.	8.0 lb. Vapor Pressure Fuel: Carburetor Bowl	Rear Tank	Total	9.0 lb. Vapor Pressure Fuel: Carburetor Bowl	Rear Tank	Total
A	90	1.02	1.40	2.42	1.52	1.66	3.18
	100	1.67	1.89	3.56	2.17	2.25	4.42
B	90	0.93	...	...	1.43	...	...
	100	1.55	...	...	2.05	...	...
C	90	0.65	...	...	1.15	...	...
	100	1.20	...	...	1.70	...	...
D	90	1.57	...	...	2.07	...	...
	100	2.20	...	...	2.68	...	...
E	90	1.00	1.30	2.30	1.55	2.30	3.85
	100	1.40	3.30	4.70	1.90	4.20	6.10
F	90	1.72	1.00	2.72	2.22	2.00	4.22
	100	2.33	2.70	5.03	2.80	3.70	6.50
G	90	1.40	1.50	2.90	1.90	1.85	3.75
	100	1.95	2.09	4.04	2.45	2.55	5.00

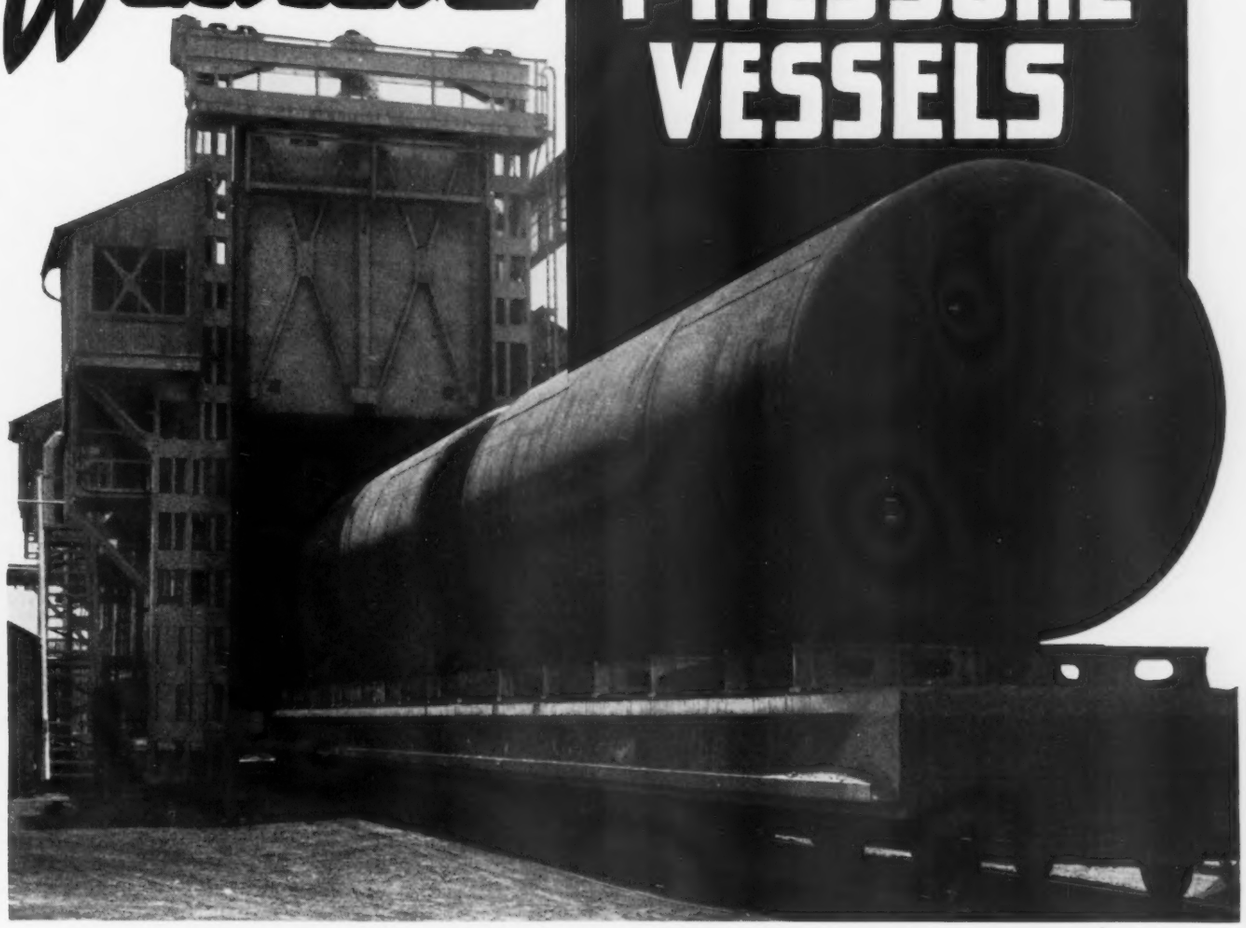
In relation to these data it should be remembered that these are minimum losses experienced under conditions of steady driving. A limited number of observations made under conditions of intermittent driving and stopping, indicate substantially higher losses.

While the major economic effect of these losses relates directly to the cost of motor fuel to the consumer, they are also of interest to the refiner in that they illustrate the extent to which the fuel he has so carefully prepared and distributed is degraded, after it has been delivered to the final consumer. The average motorist has no conception of the fact that such degrading of the fuel occurs in his car, and any complaints regarding quality are immediately laid at the door-step of the refiner. This is particularly true of anti-knock complaints.

The fuel losses observed relate directly to loss of octane number. Investigation of this relationship indicated that a loss of from 0.25 to 0.3 octane numbers occurred for each 1% loss of fuel. Since a large proportion of present day cars under usual operating conditions are on the threshold of undesirable detonation with 72 octane L-3 gasoline, particularly in hot weather, it may readily be seen that a volumetric loss of from 4 to 7%, which would result in an octane number loss of from 1.1 to 2.0 octane numbers could easily mean the difference between satisfactory and unsatisfactory performance of the fuel.

In a later portion of this paper, the annual average overall fuel loss from this source is estimated conservatively at 1.96%. This would mean an average equivalent loss

Welded PRESSURE VESSELS



The above view shows two 10 ft. diam. by 29 ft. 8 in. refinery vessels coming out of the stress-relieving furnace at our southern plant at Birmingham, Ala.

. . . for the Refinery

NO matter how "special" your requirements for refinery pressure vessels may be, our efficient, up-to-date shops are equipped to handle the job. We are qualified to produce either riveted or welded construction in a wide range of sizes. Our three modern fabricating plants are equipped to handle both field-erected and shop-assembled work. The Birmingham plant specializes in work radiographed and stress-relieved in accordance with paragraph U-68 of A. S. M. E. Code for Unfired Pressure Vessels or to meet A. P. I. specifications.

Long experience in the oil industry has given our organization an appreciation of refinery problems and requirements. This experience can be of great value to you in the efficient handling of any work of this type you may be contemplating. Address our nearest office for information or quotations on steel storage tanks of all kinds, as well as refinery vessels.

- Bubble Towers
- Fractionating Columns
- Cracking Chambers
- Polymerization Pressure Towers
- Accumulators
- Butane Tanks
- Evaporators
- Oil Stills
- Propane Tanks
- Reaction Chambers
- Absorber Towers
- Flash Towers
- Reforming Towers
- Reflux Towers
- Stripping Towers
- Vacuum Towers
- Pressure or vacuum vessels for all purposes

CHICAGO BRIDGE & IRON COMPANY

Cleveland.....2206 Rockefeller Bldg.
Chicago.....2125 Old Colony Bldg.
New York.....3345—165 Broadway Bldg.
Philadelphia..1614—1700 Walnut Street Bldg.
Boston.....1516 Consolidated Gas Bldg.
Detroit.....1513 Lafayette Bldg.
Dallas.....1439 Liberty Bank Bldg.
Birmingham.....1534 N. Fiftieth Street
Houston.....2919 Main Street
Tulsa.....1607 Hunt Bldg.
San Francisco.....1060 Rialto Bldg.
Los Angeles.....1422 Wm. Fox Bldg.

FABRICATING PLANTS in Birmingham, Chicago, and Greenville, Pa.

of 0.54 octane numbers. If we relate this octane number loss to an equivalent amount of Ethyl fluid on 70% of the annual motor fuel requirement, it appears that the refiner spends over $2,000,000.00 annually for anti-knock value, which is lost after the fuel is put into the rear tank of the automobile and before it gets into the engine.

These fuel losses therefore are of considerable importance to the refiner since they tend to prevent his customer from obtaining the performance from his product which, at a considerable cost to him, was built into it.

The Meaning of the Pawhuska Road Tests to the Motoring Public

a. Permissible vapor pressures.

At first glance, it would appear that improvement in higher permissible vapor pressures for motor fuels would work chiefly in economic benefit for the refiner. However, a review of past history clearly indicates that the petroleum industry has always passed on to the consumer in large proportion the benefits of more economical production of its products. This would undoubtedly also be true in this case. Moreover, the conservation of crude oil, which would be made possible through better utilization of butane, is certainly in the interest of the public.

Therefore the benefits which would result from better fuel systems from the angle of permissible vapor pressures are not only significant to the refiner, but are also of considerable interest to the motor fuel consumer.

b. Fuel losses.

The fuel losses from the rear tank and from the carburetor come directly out of the consumers pocket. To him such losses mean less miles per gallon, or conversely a proportionately greater fuel cost per mile.

Any attempt to make an accurate estimate of what the monetary value of these losses mean to the consumer is almost hopeless due to the many unknown factors involved. However, it is believed that, with a very few assumptions, a minimum estimate can be made which represents the minimum value these losses attain.

Over an atmospheric temperature range of from 80° F. to 110° F. this loss appears to be some figure over 4%. On an annual basis, this minimum figure is reduced, since 12.0 pounds gasoline is about the maximum vapor pressure of fuels, even when used at very low temperatures. In order to estimate what this minimum figure might be on an annual basis, it is necessary to estimate a relationship between the fuel volumes and the temperature at which they are used. Fuel vapor pressure specifications are usually based on average maximum temperatures, but the fuel is used at some lower average temperature, and it is believed that the mean of the average daily maximum and the daily average is a fair figure for this purpose.

Such an estimated relationship of fuel consumption, and temperatures, is shown in Table 5.

TABLE 5

Relationship of Fuel Consumption and Atmospheric Temperatures

Atmospheric Temperature °F.	Estimated Per Cent Fuel Consumption Based on Average Temperatures	Based on Average Maximum Temperatures	Mean
Below 70	55.93	34.87	45.40
70	22.70	15.53	19.12
80	17.44	23.31	20.37
90	3.90	20.66	12.28
100	0.03	5.25	2.64
110	....	0.38	0.19

The vapor pressures of motor fuels sold for use at various average maximum atmospheric temperatures vary from 8.0 to 12.0 pounds. Motor fuel surveys indicate the relationship shown in Table 6.

TABLE 6

Fuel Vapor Pressure vs. Average Maximum Atmospheric Temperature

Average Maximum Temperature °F.	Vapor Pressure at 100°F.—lbs.
110	8.0
100	8.0
90	9.0
80	10.0
70	12.0
Below 70	12.0

In order to use these figures, the data on four cars, taken from Table 4, and from detailed studies made on two of them, have been extrapolated, and related to the vapor pressure of fuels used, as shown in Table 7.

TABLE 7

Extrapolated Fuel Losses at Various Temperatures and Fuel Vapor Pressures—Per Cent

Car	Fuel Vapor Pressure	Average Maximum Atmospheric Temperature—°F. 70	80	90	100	110
A	8.0	...	...	...	3.6	4.7
	9.0	...	...	3.2	...	..
	10.0	...	2.8	...	...	..
	12.0	2.5	...	...	...	..
E	8.0	...	...	...	4.7	7.1
	9.0	...	...	3.9	...	...
	10.0	...	3.3	...	...	..
	12.0	4.6	...	...	...	..
F	8.0	...	...	...	5.0	7.4
	9.0	...	...	4.2	...	..
	10.0	...	3.4	...	...	..
	12.0	4.8	...	...	...	..
G	8.0	...	...	...	4.0	5.2
	9.0	...	...	3.8	...	..
	10.0	...	3.5	...	...	..
	12.0	3.2	...	...	...	..
Average		3.78	3.25	3.78	4.33	6.1

Combining the temperature and fuel consumption figures from Table 5, the vapor pressures from Table 6, and the average losses from Table 7, an estimate of the annual fuel loss is made in Table 8.

TABLE 8

Estimated Average Annual Fuel Loss

Mean Atmospheric Temperature °F.	Average Overall Loss	Per Cent Annual Fuel Requirement	Annual Fuel Loss Per Cent
Below 70	...	45.40	...
70	3.78	19.12	0.72
80	3.25	20.37	0.66
90	3.78	12.28	0.46
100	4.33	2.64	0.11
110	6.10	0.19	0.01
		Total	1.96

A conservative estimate of minimum annual fuel losses from rear tanks and carburetors of cars is therefore placed at 1.96%. On the basis of an annual motor fuel consumption of 525,000,000 barrels at an average filling station price of $0.15 per gallon, the motoring public pays at least $65,000,000.00 per year for fuel which is lost from the automobile. The actual figure probably runs considerably in excess of this amount.

Conclusions

Ignoring the technical features, relating to road test technique developed by this work, and confining the conclusions reached only to the economic aspects, it may be stated:

a. The fuel system characteristics of the nine 1937 model cars tested vary considerably.

b. From the standpoint of permissible vapor pressures, if the poorest car were improved to equal the best, the refining industry could utilize additional butane in motor fuel, amounting to 1.226% of the annual motor fuel requirements. It is estimated this would net the industry at least $16,000,000 annually, and, in addition, decrease lead expense by $1,800,000.

c. Fuel losses from rear tanks and carburetor vents will run from 4 to 7% in hot weather, and higher, depending upon the type of driving. A conservative annual estimate of 1.96% minimum loss has been made by the writer.

In hot weather this accounts for octane number losses of 1.1 to 2.0 octane numbers, and will average at least 0.54 octane numbers on an annual basis. In terms of lead, this anti-knock loss is valued at approximately $2,000,000.

An annual fuel loss of 1.96% from the car costs the consumer at least $65,000,000.

References

[1] Legatski, T. W. and Couch, R. R. Fuel Systems of 1937 Automobiles. Proceedings 18th. Annual Meeting American Petroleum Institute Chicago, Illinois, Nov. 8 to 12, 1937.

[2] Kincer, Joseph B. Atlas of American Agriculture Part II Climate, "Temperature, Sunshine, and Wind."

[3] Alden, R. C. Butane, A Wasted Asset of the Petroleum Industry. Refiner and Natl. Gasoline Mfr. 13, (6), 208-14, June (1934).

"State of the Art"

AS SEEN IN THE WORLD'S CURRENT TECHNICAL LITERATURE

Propane Dewaxing Data Revealed

Dewaxing and deresining in propane solution proves most satisfactory of several methods in increasing yields and decreasing costs. W. B. McCluer, J. T. Dickinson, and H. O. Forrest, Oil & Gas J., Mar. 31, 1938, *p.* 113.

Most satisfactory process for improving the refining of Pennsylvania lubricating oils is dewaxing and deresining in propane solution, it was found by Kendall Refining Co. after a complete study of all available processes. A plant of this type, now installed for sufficient time to show its capabilities, has decreased the cost and improved the yields in dewaxing and has decreased the cost and increased the capacity of the decolorizing plant.

Data from a 14-day test run proved the ability of the plant to produce consistently high yields of zero pour-test bright stock from Pennsylvania residuum. The effect of deresining is shown by the decrease in color of approximately 80% with the removal of 4.8% of resins. On dewaxing alone, the carbon residue dropped from 2.33 to 2.19 (in contrast to the usual increase with other dewaxing solvents) and the color dropped from 3250 to 2094 optical density (O. D.).

Color improvement is accounted for by its concentration in the wax where high O. D. indicates inclusion of some heavy resins. If proper credit were given to the propane process for resin removal, an even higher yield than 86.1% of zero pour dewaxed oil could be shown for a charge rate of 1310 barrels per day. Viscosity of 165 S. S. U. at 210° F. is obtained.

The deresining operation reduces the O. D. color to 750 and the carbon residue to 1.73 while the pour remained 0° F. and viscosity was 148 S. S. U. at 210° F. The large concentration of color bodies in the resin fraction is shown by its color of 28,960 O. D. and its carbon residue of 12.5%.

The plant also produced 20° F. pour-point bright stock during a seven-day test with yields of 86.6% dewaxed and deresined oil, 3.7% resins and 8.9% petroleum. Yield of 20° F. pour-test bright stock is 90%, indicating an increase in yield of 1% above 86% for each 5° F. rise in pour point above 0° F.

Average results from the plant under these conditions show a reduction of 1 to 1.5% in resin precipitation, and the difference in color was apparent in filter-house operation and costs. Prior to installation of the propane plant the clay requirement was about 90 tons per day for 350 barrels of bright stock. With the plant operating to remove 3 to 4% of resins, the plant now decolorizes 680 barrels per day with 80 tons of clay, or only 46% of what would have been required on the old basis. The decolorizing plant is operating at 80% above its previous capacity.

During the entire period of test on reduced neutral, the pour point of the dewaxed oil was —5° F. or lower and the yield, based on charge, was 81.6%. Product yield of zero pour-point neutral is 84%. The neutral can be dewaxed without an aid but yield is reduced to 77% or below because of the fluffy character of the wax, it is indicated by previous laboratory work. Highly satisfactory operation is obtained by blending 2.5 to 3.5% petrolatum with the neutral. The anticipated loss of 7% in yield by operating without petrolatum additions would correspond to a reduction in revenue of $300 per day. Separation of wax is done by a small amount of fractionation. Slack wax so produced is being sweated to produce about 57% of 124-126° F. A.M.P. wax, but higher melting point waxes may be produced.

The saving in manufacturing cost of producing bright stock may be considered as entirely due to the decrease in percolation cost if the cost of deresining is charged to dewaxing, because the combined operating cost is equal to the cost of the previous method of dewaxing. However, if the deresining operation bears its proper proportion of the cost, there has been a material reduction in the cost of dewaxing. For a plant where steam costs about 30 cents per 1000 pounds and electricity about 5 cents per k.w., the direct operating cost will be from 25 to 30 cents per barrel of charge, exclusive of maintenance and depreciation. For dewaxing only, as in the case of neutrals, the cost will be somewhat lower because of the smaller amount of propane to be evaporated, and will usually range between 18 and 23 cents per barrel of charge.

* * *

Bauxite is No Cure-All

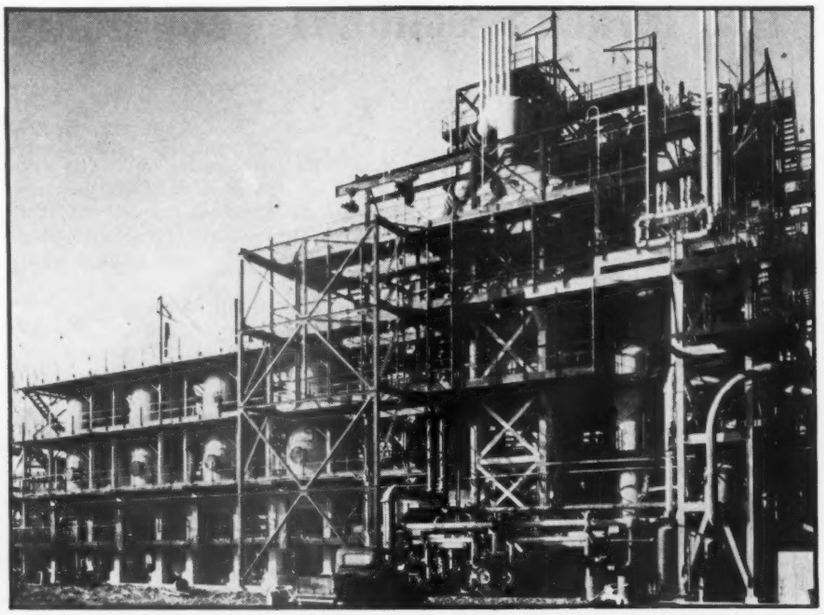
Choice of adsorbent must be based upon the individual refining problem. R. H. Hubbell, Jr. and R. P. Ferguson, Refiner, March, 1938, *p.* 104. .

Plant-scale percolation with bauxite has been found to contrast sharply with operation using other commercial adsorbents. Selectivity of bauxite, coupled with its sensitivity to certain variables have been found to decrease its adsorbent value for some types of oil stocks. In the final analysis, therefore, the choice of adsorbent depends upon a careful study of the individual refining problem.

Outstanding advantages of bauxite as an adsorbent medium are mainly in its revivification qualities, notably the elimination of the disposal of spent adsorbent, the elimination of the necessity or the segregation of different burnings, and increase in filter house capacity. Further advantages are the possibility of producing oil of somewhat lower carbon specifications, and the high yields of light-color oils obtained.

An outstanding problem lies in the difficulty in maintaining high yields of neutrals and other light distillate stocks. Since high efficiencies depend upon low burning temperatures, precise control of the burning operation is necessary. A further problem is the delicacy of control requisite to satisfactory filter washing. With increased revivifications the ease of washing the residual oil from the bauxite increases. Operating difficulties have arisen as a result of the physical characteristics of bauxites. These include high belt maintenance owing to the slow cooling, elevator slippage at desired throughputs due to the high density, and high furnace repair costs because of the elevated temperatures of burning. These latter problems may be overcome readily by modifications in equipment design.

The decolorizing efficiency of bauxite will be found to vary over a considerable range depending upon the type of stock to be decolorized, as well as the finished oil color. In the solution percolation of residual stocks, increase in burning temperature to 1600° F. results in progressively



Three Times—

In 1934 the (then) world's largest cracking unit began operation. Four Gray clay towers treated the cracked gasoline vapors to produce a superior grade of gasoline.

In 1935 another cracking unit was started at the same plant and additional Gray clay towers specified.

In 1938 the refinery's third cracking unit will begin operation and again Gray clay towers will treat the cracked gasoline vapors.

Repeat orders have also been received for small units. The Gray Process is efficient and economical when applied to the smallest as well as the largest plants.

THE GRAY PROCESSES CORPORATION

Licenses granted under United States and Foreign Patents by The Gray Processes Corporation

26 JOURNAL SQUARE • JERSEY CITY • NEW JERSEY

GRAY CLAY TREATING

increased decolorizing value at dark finished colors, decreased decolorizing value at light finished colors, and progressively lessened effect upon finished oil quality. Greatest efficiency is obtained by percolation at the maximum practicable temperature. In the straight percolation of light colored distillate stocks, maximum efficiency is obtained by operation at the minimum practicable temperatures of burning and filtration.

Examination of a large number of bauxite samples shows wide variation in physical and chemical properties. In one deposit the alumina content ranged between 46 and 84%. Decolorizing efficiency on a weight basis is found to decrease roughly in proportion to the percentage of alumina in the material, but there are many exceptions. It became apparent that the only method of ascertaining the decolorizing efficiency of a given bauxite sample is to compare yield with fuller's earth. The physical characteristics of bauxite which bear upon its usefulness as a decolorizing agent are bulk density and susceptibility to disintegration on steaming.

* * *

Alcohol-Gasoline Water Tolerance

Alky-gas motor fuel is better with n-propyl alcohol in water tolerance but has other disadvantages. Elizabeth W. Aldrich, Natl. Bur. Stds., Research Paper, RP 1060.

Water tolerances of mixtures of gasoline with *n*-propyl alcohol are, in general, greater than those of mixtures with the same percentage of ethyl alcohol at all temperatures of practical interest. However, if separation of *n*-propyl alcohol occurs below 5°F. the second phase will be solid, or if separation occurs above this temperature, the liquid which separates will freeze if lowered to this temperature.

Although the greater water tolerances of mixtures of gasoline with *n*-propyl alcohol give them an advantage over mixtures with ethyl alcohol if used as motor fuels, consideration must be given to the possible disadvantage of the formation of solid material which does not occur in mixtures with ethyl alcohol.

Differences in water tolerance between ethyl and *n*-propyl alcohol in gasoline are greater at the lower temperatures and with the higher alcohol concentrations. At the higher temperatures the water tolerances are more nearly the same and in some cases, particularly at the lower alcohol concentrations, the amount of water which may be present without separation is greater if the mixture contains ethyl alcohol. However, the temperatures at which the water tolerances of ethyl alcohol mixtures are greater, are above atmospheric temperature in most cases and are therefore of no practical interest.

The alcohol used in experiments was a commercial refined product and was used without further purification. Density was 0.79668 at 30°C. and its boiling range was from 96.2 to 97.2°C. (205-207°F.), corresponding to an aqueous solution containing 99.67% by weight of *n*-propyl alcohol.

* * *

Refinery Automatic Control

Refinery control instruments are passing through a stage of being accessories instead of being integral parts of plant design. S. W. Adey, J. Inst. Pet. Tech. March, 1938.

Automatic control equipment for refinery process operation is now passing through very much the same stage as did the accessories on motor-cars a few years ago. By this is meant that a piece of refinery plant may be designed and built, and then the instrument added as an afterthought. Until instruments come to be considered as much an integral part of the plant as, say, the pumps, they will justify as much criticism as did the motor-car accessories of old.

It is only during the last four or five years that instrument-makers have obtained a real grasp of the processes for which they were trying to build control gear. It must be realized that the control of any given physical condition, such as temperature, is a different problem on every kind of plant, and no one fixed type of instrument can possibly meet every requirement efficiently.

There are three technical considerations in the application of automatic control: selection of conditions to be controlled, selection of the point of control, and time lag and the stabilization of controllers. The relationship between process time lag and the instrument is extremely complex, but the important point to bear in mind is that when a condition change occurs, such as in a pipe-still outlet temperature, a controller can measure only the magnitude of the change itself, and not the magnitude of the force causing it.

Process lag troubles have been largely eliminated in modern instruments by incorporation of stabilizing and automatic re-set devices. The principle of these is briefly as follows: instead of waiting for the controlled condition to re-correct the position of the control valve, an attempt is made to do this by using the change in air pressure on the diaphragm of the control valve as soon as it occurs and also the change in fluid flow (or pressure) immediately controlled by the diaphragm valve.

The effect of stabilizing and automatic re-set features in modern instruments has been almost revolutionary as far as their application to refinery work is concerned. These features have, for the first time, made automatic control really possible in the sense that instruments can, in many cases, do as much or more than an operator is able to do by forethought and experience. Operating labor and possibly overall running costs may be reduced.

It is wise policy of a refinery management to insist upon the use of instruments of the first class. The most effective layout of a unit may often be improved upon from the mechanical aspect if automatic control is substituted, because the latter lends itself to distance operation. Thus pumps may be placed close to their individual duties, instead of grouping them in a single pump-house and employing long suction lines. Also furnace firing fronts may face away from the unit, with consequent increase in safety.

A possible disadvantage in an emergency is the reduction in plant familiarity of the operators who may not act as quickly in an emergency. However, in a really large plant, an emergency can be handled more expeditiously.

* * *

Grignard Reagent is Analytical Tool

Several characteristics of hydrocarbon oils can be determined by employing methyl magnesium iodide. R. G. Larson, Ind. Eng. Chem., Anal. Ed., April 15, 1938, *p.* 195.

A Grignard reagent (methyl magnesium iodide) has been applied with some success as an analytical tool during a chemical and electrical study of oil oxidation. The determination of minute amounts of water in oil, the establishment of an oxygen balance during oil oxidation, and the approximate prediction of oxidation stability by a single test on the original oil have been accomplished by using apparatus similar to the "Grignard machine."

Experimental procedure was adopted which compensated for dissolving of methane in the petroleum hydrocarbons. When a standardized procedure is strictly adhered to, check runs of 0.1 cc. of methane evolved can be obtained. Presence of minute amounts of water was found to be important and must be determined. The amount of methane produced is a measure of the amount of acids, alcohols, and water present. The amount of reagent consumed is an indication not only of these substances, but of all other oxidation products, such as peroxides, esters, aldehydes, and ketones, and is therefore an indication of the total content of oxidized molecules.

Evidence was acquired which demonstrated that the evolution of gas when an oil is treated with methyl magnesium iodide is a property of the normal constituents of the oil. This is shown by the fact that the initial evolution of gas was not appreciably altered by any of a series of successive operations, such as degassing, distillation, clay treatment, and heating with sodium, which might be expected to remove water and oxidation products. It can only be suggested that the correlation arises from reaction with sulfur compounds, reaction with active hydrocarbons of the indene type, or deep-seated decomposition reactions catalyzed by the magnesium complex.

Properties Which Affect Lubricating Oil Performance

By H. M. RUGG

Abstract

Most important properties in their effect on consumption are viscosity, volatility and this author states, with oxidation resistance having some effect. Comparing two oils of 210° F. viscosities of 43 and 63 and V. I. of 13 and 100 respectively, the lower V. I.-lower viscosity oil consumed 22 quarts, the other 10 quarts in 48 hours' operation.

Some articles in the literature are summarized to show that no definite ratio exists between Conradson Carbon residue and the carbon deposition in an engine.

A SCIENTIFIC understanding of lubricant qualities and specifications has grown with the years, frequently by means of fundamental new discoveries and sometimes simply through convenient methods of expression or comparison of qualities long recognized. Some would revert to a less analytical conception of motor oil properties but the trend of thought and research seems to be contrariwise. With this circumstance in mind, it may be well to review some of the evidence relating to lubricant suitability.

The motorist's desires in regard to the performance of lubricants may be summarized somewhat as follows:

(1) The car must be started in spite of low temperature or other adverse conditions; furthermore, the fuel is now seldom blamed for starting failure.
(2) Consumption must be moderate.
(3) Engine repairs which may be influenced by the character of the lubricant must not be extensive.

Starting

Refiners have made available lubricants which will permit starting at the lowest temperatures encountered and also have high enough viscosity at operating temperature for protection of the motor parts. It seems hardly safe to rely upon fortuitous dilution of the crankcase contents for easy starting (3). Even in winter, long hard runs may be made with oil temperature and crankcase ventilation acting together to reduce dilution.

Premium fuels frequently have low end-points and other fuels may be modified to follow the trend. Dilution is generally considered an undesirable feature on account of its action on the oxidation resistance of the oil. Furthermore, Mougey (11) has indicated that high oil dilution is a cause of high consumption on account of low viscosity produced by fuel residues. The remedy is suitable crankcase ventilation.

It has been noted that engines operated with very volatile fuels evidence lubricating oil deterioration to a smaller degree than usual; for example, an engine (1) using gaseous propane fuel frequently allowed 750 hours operation without replacement of the original oil charge. This time of operation with the Waukesha ice engine would correspond to 22,500 miles of operation of a truck at an average speed of 30 miles an hour.

Of oil properties having a bearing on consumption, viscosity and volatility are usually considered to be the most important. Oxidation resistance of lubricants is also of consequence in this connection though the evaluation of this quality for different oils offers considerable difficulty. The relative importance of viscosity and volatility in determining the amount of oil used in an engine operating under any definite set of conditions has not been established at the present time. In much of the reported data one test oil has differed from another in both viscosity and volatility. However, in some experiments only one of these properties was varied; it may be of interest to examine some of the results of such work.

Viscosity. Otto, Miller, Blackwood, and Davis (12) observed the oil consumption of a Ford "A" engine lubricated with a Coastal distillate and then with the same stock to which Paratone had been added in small amounts to increase viscosity index and viscosity. Since the two oils should have substantially the same volatility, the effect of viscosity alone on oil consumption should be evident. From the data shown in Table 1, it is clear that the amount of the more viscous oil used is considerably smaller than that of the thinner oil.

Graves (7) has given a review of work done in regard to oil consumption experienced with products of different viscosities. An interesting observation is that consumption decreases with viscosity up to a certain critical value (a viscosity of about 75 Saybolt seconds at 210°F. is indicated in the results of one experimenter) and then increases again. Graves suggests that as viscosity increases the amount of oil thrown on the cylinder wall decreases with concomitant lessening of oil consumption but that certain oils may be so viscous that they do not flow from the cylinder walls or through the drain holes sometimes drilled in pistons for this purpose, these circumstances fostering higher consumption.

TABLE 1
Effect of Viscosity on Oil Consumption
(Otto, Miller, Blackwood, and Davis, Oil Gas J. 33, No. 26, 98 (1934))

	Coastal Distillate	Coastal Distillate plus Paratone
Viscosity at 210° F., S.S.	43	63
Viscosity Index	13	100
Time of Test, Hours	48	48
Load	2/3 throttle	2/3 throttle
Approximate Speed, r.p.m.	1500	1500
Total Oil Consumption, Qts.	22	10

Volatility. In several instances it has been indicated that oil volatility is of consequence in relation to consumption. Davis and Best (4) prepared a series of Midcontinent oils matched in viscosity (approximately 235 Saybolt seconds at 130°F., approximately 63 Saybolt seconds at 210°F.) but differing in volatility, neutrals ranging from 70 Saybolt seconds at 100°F. to 430 Saybolt seconds being blended with a given bright stock. Oil No. 9 is a close-cut overhead product matched in viscosity with the eight foregoing oils. Volatile oils showed a greater consumption under various conditions of operation than did less volatile products. The oil blended with 225 neutral was employed for comparison, its consumption being taken as 100 under any particular set of conditions. Some of the extensive data of Davis and Best may be seen in Table 2.

Graves (7) lists data of various investigators who have been interested in the effect of volatility on oil consumption.

TABLE 2

Effect of Volatility on Consumption of Oils Matched in Viscosity

Davis and Best, Natl. Petroleum News, 27, No. 26, 70 (1935)

Oil Number	Neutral Viscosity 100° F.	Relative Consumption in Chevrolet Block Tests 40 m.p.h.	50 m.p.h.	60 m.p.h.	Relative Consumption in Chevrolet Road Tests 50 m.p.h.
1	70	140	149	136	146
2	100	116	125	119	134
3	150	107	121	116	143
4	180	105	108	104	131
5	200	104	103	105	...
6-S	225	100	100	100	100
7	240	96	97	97	...
8	430	...	98 av.	...	...
9	555	94	91	94	...

The General Motors Research Laboratories formulated two oils of 60 Saybolt seconds at 210°F., one from a volatile neutral and a non-volatile bright stock and another from a non-volatile neutral and the same bright stock; chassis dynamometer tests under conditions equivalent to 45 miles per hour road speed indicated that the more volatile oil gave 296 miles of operation per gallon consumed while the less volatile oil gave 605 miles: similarly, an oil of 98 Saybolt seconds at 210°F. blended from non-volatile neutral and bright stock gave 650 miles per gallon but an oil of the same viscosity using a more volatile blending stock along with bright stock evidenced only 392 miles per gallon.

The data of Livingstone, Martin, and Marley (10) quoted by Graves (7) and also by Born (3) hardly seem to justify conclusions as to the effect of volatility on oil consumption. It is reasonable to suppose that oil loss due to volatilization is proportional to the vapor pressure of the oil at possible points of vaporization, but this value is not readily obtainable from the usual distillation data. For example, Oil 3 can be distilled to a greater extent before cracking occurs; nevertheless, it is a comparatively close-cut oil and has a higher flash point than either Oil 1 or Oil 2. No suitable basis of comparison for the volatility of these three oils is apparent from the properties listed.

Other Factors. It is inferred by Born (3) from test results on a truck motor attached to a dynamometer that consumption is a function of Conradson carbon residue value. The data indicate that an oil with a carbon residue value of 0.38 per cent was consumed in the amount of 1681 cc. (0.44 gal.), while a lubricant with 0.65 per cent carbon residue showed a consumption of 1984 cc. (0.52 gal.). Since data on viscosity and volatility characteristics of the oils are not given, it is impossble to evaluate the effects of these important variables. It seems possible that an oil with very low Conradson carbon residue might still have such low viscosity, high volatility, or both that a great deal of it would be consumed.

Maintenance

Such maintenance expense as that associated with ring sticking, carbon removal, bearing replacement, and valve grinding is usually considered in connection with the lubrication problem. The present discussion will be confined to ring sticking and carbon removal.

Ring Sticking. Ring sticking occurs in automobile engines to a greater or lesser extent, depending on the conditions of operation and the oil used. Needless to say, it is a highly undesirable phenomenon. In order to obtain a correlation with an oxidation test which he recently developed Fairlie (6) tested several oils in a four-cylinder engine for their ring sticking qualities. The results as summarized in Table 3 indicate that those oils most stable to oxidation produce the least ring sticking.

On the other hand, Lederer and Zublin (9) refer to ring sticking tests carried out by S. D. Heron in a one cylinder engine with a jacket temperature of 350°F. It was the conclusion of Lederer and Zublin that Midcontinent oils are as good as, or better than, Eastern oils, while asphaltic oils seem to be somewhat worse in respect to ring sticking.

TABLE 3

Ring Sticking Produced by Various Oils

Jacket Temp. = 250° F. Crankcase Temp. = 220° F.

(Fairlie, M., Oil Gas Journal, 34, No. 44, 114 (1936))

Description of oil	Viscosity of oil 210°F. S.S	Sludging time Indiana oxidation test, hours	Induction period in Sinclair oxidation test, hours	Total Number rings stuck
Penna., highly solvent treated	61	375	300	4
Penna., mildly solvent treated	61	125	210	4
Penna., conventionally refined	61	90	150	6
Midcontinent, acid treated.....	61	25	81	9
Gulf Coast, conventionally refined	71	16	68	10

Carbon Formation. If carbon has to be removed from a motor before it must be torn down for mechanical adjustment or replacement or if carbon deposition has contributed to the necessity for such repairs, obviously the maintenance cost is increased. No completely satisfactory solution for the carbon deposition problem seems to be available. Not only is it in general impossible to eliminate carbon deposition but it is impractical to estimate its extent even with oils of well known composition and properties used under a defined set of conditions. In certain cases the carbon residue value of an oil may be indicative of the amount of carbon formed in an engine; this was an early view of Livingstone, Martin, and Marley (10) and is expressed by Born (3) who found that carbon deposits in a truck engine from two oils evidenced about the same ratio to each other as the carbon residue values of the original oils.

Gruse and Livingstone have recognized (8) that newer methods of refining have largely invalidated the prediction of engine carbon from Conradson carbon. Of especial interest are the last three oils shown in Table 4; these have carbon residue values approximately the same but the deposits of coke per liter of oil vary considerably.

The extensive data of Bahlke, Barnard, Eisinger, and FitzSimons (2) also indicate the lack of correlation between Conradson carbon residue and carbon deposits in engines.

Everett and Keller (5) in tests on 1933 type Dodge engines under carefully controlled conditions simulating road operation at 60 miles an hour for 24 hours have found engine carbon deposits for a number of oils. The carbon deposit listed in Table 5 is the average value obtained for the four engines used in testing each oil and includes about 10% of oil and inorganic material. Perusal of these data does not indicate any correlation between carbon residue value and engine deposits; in fact it may be noted that two oils of substantially the same viscosity and each having a carbon residue value of 0.42 gave carbon deposits representing the least and the greatest amounts observed.

TABLE 4

Variation in Carbon Residue and Carbon Deposits in Oils of About the Same Viscosity

Oil	Viscosity 210°F., S.S.	Carbon residue	Deposit, grams of coke per liter of oil
Normal Pennsylvania	62	0.62	7.9
Solvent-refined Pennsylvania.....	62.6	0.48	7.3
Specially refined Pennsylvania....	65.8	0.17	6.2
Solvent-refined Naphthenic.....	68.4	0.18	4.3
Solvent-refined Midcontinent	63.5	0.16	7.0

TABLE 5

Carbon Deposits in Dodge Engines

Oil Number	Viscosity 210°F., S.S.	Conradson carbon residue, per cent	Weight of Carbon deposited in engine, grams
1.....	61.6	0.60	12.65
2.....	61.5	0.42	9.76
3.....	61.9	0.22	10.59
4.....	61.9	0.42	13.40
5.....	61.8	0.18	11.85

Summary and Conclusions

The qualities desired in motor lubricants have been listed as ease of starting, moderate consumption and preservation of the various functional parts of the motor.

Oils which satisfy these requirements have been known since the beginning of the oil industry. Oils which are referred to as Pennsylvania or high viscosity index products have long been recognized for their viscosity

stability to heat and cold. The expression of this property through the use of the viscosity index started in 1929 with the publication of the well-known Dean and Davis paper. The advantages of easy starting at one temperature extreme and motor protection at the other are too well established to bear detailed repetition here.

The maintenance of viscosity at operating temperature of high viscosity index oils controls consumption, keeping it at a moderate figure. The low volatility of Pennsylvania oils is also a factor in permitting high lubricant mileage.

Elimination of starting difficulties, maintenance of oil films at elevated temperatures, moderate consumption and resistance to oxidation and allied phenomena all help to assure a minimum of engine repairs when Pennsylvania oil is used. The experience of motorists at home and abroad since the first automobiles were produced has confirmed the value of Pennsylvania lubricants and extended their use to every section of the globe.

* * *

Literature References

(1) Anonymous, Automotive Industries, 77, No. 22, 784 (1937).
(2) Bahlke, W. H., Barnard, D. P., Eisinger, J. O., and Fitz-Simons, O., S. A. E. Journal, 29, 215 (1931).
(3) Born, S. Natl. Petroleum News, 29, No. 48, R-354 (1937).
(4) Davis, L. L., and Best, R. D., Natl. Petroleum News, 27, No. 26, 70 (1935).
(5) Everett, H. A., and Keller, G. H., The Pennsylvania State College, unpublished results.
(6) Fairlie, M. Oil Gas J., 34, No. 44, 114 (1936).
(7) Graves, W. H., Am. Soc. Testing Materials, Symposium on Motor Lubricants, New York City, March 8, 1933, page 85.
(8) Gruse, W. A., and Livingstone, C. J., Am. Soc. Testing Materials, Symposium on Lubricants, Chicago, March 3, 1937, page 1.
(9) Lederer, E. R., and Zublin, E. W., Natl. Petroleum News 22, No. 40, 27 (1931).
(10) Livingstone, C. J., Martin, E. C., and Marley, S. P., S. A. E. Journal 25, 489 (1929).
(11) Mougey, H C., Am. Soc. Testing Materials, Symposium on Motor Lubricants, New York City, March 8, 1933, page 113.
(12) Otto, M., Miller, F. L., Blackwood, A. J., and Davis, G. H. B., Oil Gas J. 33, No. 26, 98 (1934)

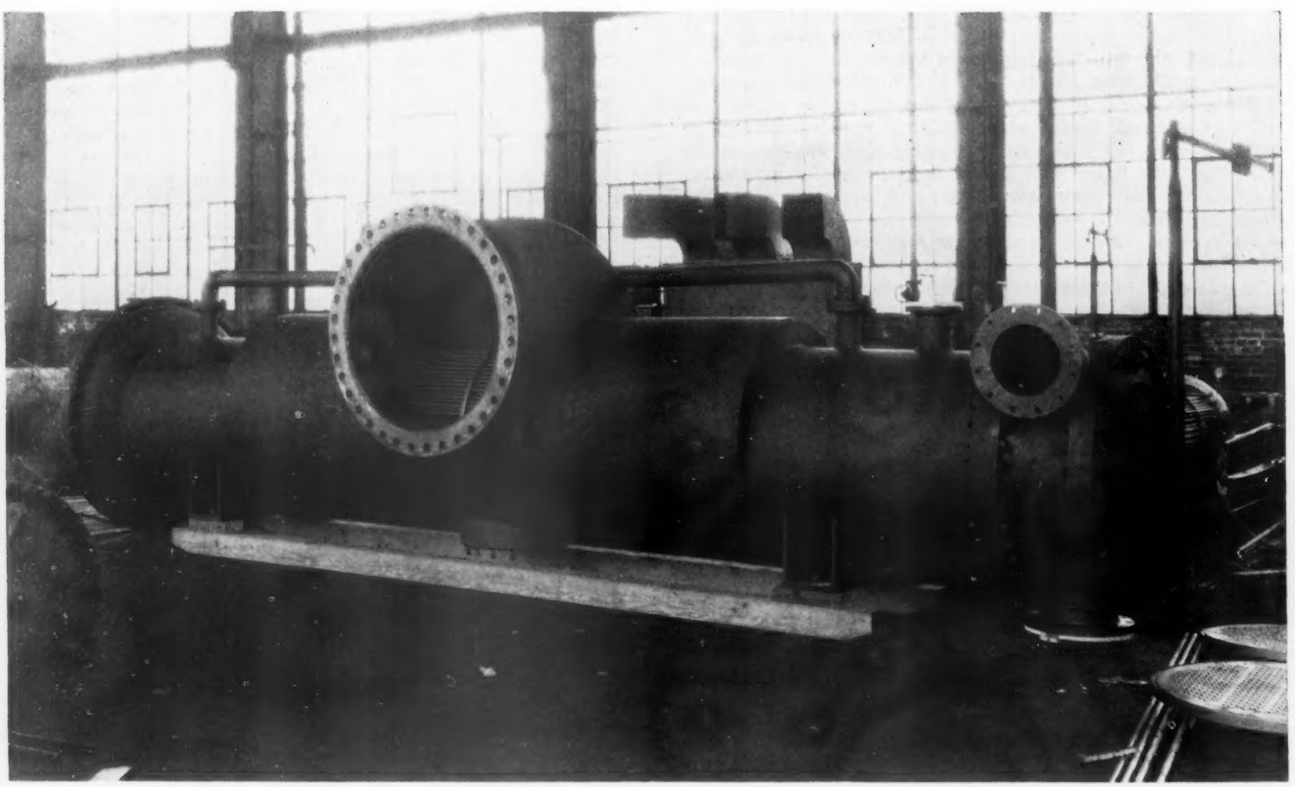
Waste Disposal Without Damage To Property is Practical

Petroleum wastes can be reduced materially and the remainder disposed of without injury or damage to other properties, preliminary studies by Ludwig Schmidt and C. J. Wilhelm of the Bureau of Mines indicate. Details of their studies to date have been published as Report of Investigations R. I. 3394.

Reduction of wastes can be accomplished by keeping pumping machinery, tanks, and other lease equipment in good repair and by proper operating methods and treatment of emulsions. Disposal of wastes without injury or damage to other properties may be accomplished by proper design, location, and operation of oil and water separators and brine pits and proper drainage from well sites, powers, material yards, etc., it was found.

Although the studies are far from complete, it was pointed out that wastes should be isolated and handled separately from the oil-field brines because their proper disposal requires entirely different methods. The report goes to considerable detail in explaining the injurious effects of petroleum wastes on the soil, on vegetation, on aquatic and wild life, and on livestock. This is followed by discussion of the reduction of wastes with numerous illustrations showing the difference between good and bad practice. The discussion of emulsions tells various methods for preventing and breaking them. Combination brine and waste oil disposal plants are described and some cost data given.

The report is concluded with a discussion of soil and water resources of the Kansas oil area by Ogden S. Jones. The report includes three maps of the state showing waterways and soil types.



Above is one of three new two-pass type reverse flow condensers installed recently in a large oil refinery. This condenser is designed to condense 36,000 pounds of steam per hour using 2610 gallons of cooling water per minute at 90° F. The unit contains 2700 square feet of ¾-inch, No. 18 B.W.G., arsenical copper tubes, 20 feet long between tube plates. Diameters of the cylindrical shell are 46 inches in the center and 40 inches in the two end sections. Steam enters through a 42-inch inlet from the turbine. After six months of operation with dirty circulating water the heat transfer is said to have been still unusually good. In the two-pass design, water is passed first through an upper bank of tubes and then is returned through a lower bank. With this arrangement, air and non-condensable gases are removed at the top of the unit and are chilled as they come in contact with the coldest tubes—
Courtesy of Foster Wheeler Corp.

Is Your Cracking Plant

RENOVIZED?

(renovate + modernize = renovize)

Generally speaking, *renovizing* means making old equipment good as new and adding new equipment to accord with latest practice.

Applied to cracking plants, *renovizing* means replacing all worn out equipment and modernizing by adding vis-breaking, vapor recovery and polymerization units.

A *RENOVIZED* CRACKING PLANT
IS A FIRST FOUNDATION FOR
REFINERY PROFITS.

ALCO PRODUCTS

DIVISION OF

AMERICAN LOCOMOTIVE COMPANY
THIRTY CHURCH STREET NEW YORK, N. Y.

AMERICAN LOCOMOTIVE SALES CORP.
ARTILLERY HOUSE, ARTILLERY ROW, LONDON, S. W. 1, ENGLAND

Patent Literature OF TODAY

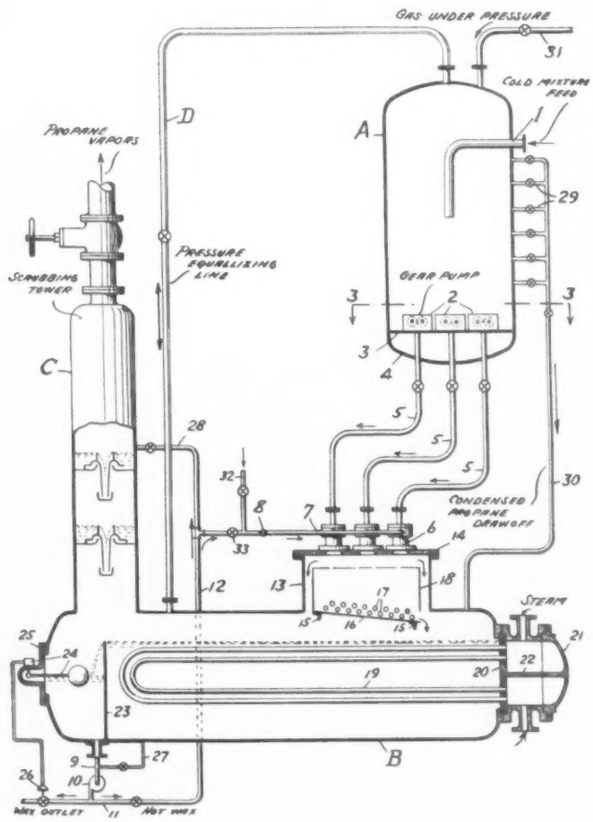
Lubricating Oil. No. 2 109 357, *issued Feb.* 22, 1938; *filed Jan.* 22, 1934; *B. H. Lincoln and A. Henriksen, assignors to Lubri-Zol Dev. Corp.; no drawing;* 7 *claims.*

A small amount (0.1-5.0%) of a chlorinated naturally occurring ester, having waxlike characteristics, is added to lubricating oil to improve oiliness characteristics. It is selected from the group: spermoil, bottlenose oil, carnauba wax, candelilla wax, Raphia wax, cottonseed wax, gondang wax, palm wax, beeswax, spermaceti, Rump gland wax, Japan wax, and myrtle wax.

* * *

Propane Separation. No. 2 111 957, *issued March* 22, 1938; *filed Aug.* 13, 1935; *D. B. Banks and P. D. Barton, assignors to Sun Oil Co.;* 4 *drawings;* 7 *claims.*

A cold mixture of propane and a high boiling point hydrocarbon are separated by continuously flowing separate streams of the mixture (from chamber A by pumps 2) and of a heated high boiling point hydrocarbon (through line 7) toward a common locus of mixing (jets 6) and evaporation (dome 13) while imparting to both streams a substantially increased velocity. They are intimately



mixed at this velocity thereby promoting evaporation of propane by mechanically breaking up and heating (steam coils 17) the newly formed mixture.

Liquid wax (heated by steam coils 19) collects to a level fixed by a float (24). Propane vapors pass up the bubble tower (C) supplied with molten wax (12 and 28) which washes the vapors of entrained wax particles.

Lubricating Oil. No. 2 108 357, *issued Feb.* 15, 1938; *filed Nov.* 14, 1935; *J. M. Musselman and E. B. McConnell, assignors to Standard Oil Co. (Ohio); no drawing;* 7 *claims.*

Deterioration of lubricating oils subject to high temperature on ferrous base surfaces is resisted by addition of .01-1% of certain glycyl oxy-hydrogen compounds. As an example: with a Mid-Continent neutral lubricating stock having a viscosity of 437 S.S.U. at 100° F., there is incorporated 0.01% of nitrogen-para-tolyl-glycyl-1,2-dihydroxybenzene.

* * *

Grease Making. No. 2 108 672, *issued Feb.* 15, 1938; *filed June* 7, 1935; *Gus Kaufman, assignor to The Texas Co.; one drawing;* 3 *claims.*

Hardness of a soda base grease of fibrous texture and maximum water content of 1.5% is increased without increasing soap content. Prior to packaging the grease it is passed in a thin film between highly rotating, closely spaced smooth surfaces where it is thrown outwardly by centrifugal force while being subjected to a shearing action, with resultant substantial decrease in the A.S.T.M. penetration of the grease.

* * *

Lubricating Oil. No. 2 108 954, *issued Feb.* 22, 1938; *filed Dec.* 20, 1934; *J. I. Wasson, assignor to Standard Oil Development Co.; no drawing;* 6 *claims.*

A lubricating oil having a tendency to form sludge on oxidation is improved by addition of a small amount of an aliphatic hydroxy-sulfide in which the hydroxy radical and the sulfur are attached directly to the aliphatic group.

* * *

Alcohol. No. 2 109 004, *issued Feb.* 22, 1938; *filed Aug.* 12, 1936; *F. M. Archibald and H. G. Schneider, assignors to Standard Alcohol Co.; one drawing;* 7 *claims.*

An alcohol such as isopropyl is produced directly from an olefin such as propylene by contacting the olefin with an aqueous hydrating catalyst such as sulfuric acid of 1% to 84% concentration under a partial initial pressure of the olefin above two pounds per square inch and a hydration temperature above 30° C.

* * *

Dewaxing. No. 2 109 125, *issued Feb.* 22, 1938; *filed May* 29, 1936; *B. G. Aldridge and B. Hopper, assignors to Union Oil Co. (Cal.);* 2 *drawings;* 21 *claims.*

Oil containing precipitated wax is applied to an inclined electrode surface in the form of an upward moving belt so as to flow by gravity in the opposite direction of the belt. An electric field is established between the electrode surface and electrodes separated from and directly over the surface. This field is of sufficient intensity to produce an electrical windage impinging upon the oil layer whereby wax is deposited from the oil in the form of a dense layer upon the electrode surface. This layer moves out of the field and is scraped from the moving belt after being scrubbed by a forceful liquid spray to remove adhering oil.

Another apparatus using the same principle is covered by Patents 2,109,130-1, assigned to Union Oil Co. by H. F. Fisher, and by 2,109,350, by L. Dillon.

TO ALL

Natural Gasoline Men

Greetings

FROM THE

NATURAL GASOLINE SUPPLY MEN'S ASSOCIATION

We are looking forward to seeing you at the

SEVENTEENTH ANNUAL CONVENTION

of the

NATURAL GASOLINE ASSOCIATION OF AMERICA

May 11-12-13, Hotel Tulsa
Tulsa, Oklahoma

MEMBERS

The Brown Instrument Company
Burrell-Mase Engineering Company
The Bristol Company
Chaplin Fulton Manufacturing Company
Chicago Bridge and Iron Works
Clark Brothers Company
Continental Supply Company
Cooper Bessemer Corporation
S. R. Dresser Manufacturing Company
The Fisher Governor Company
The Foxboro Company
Frick-Reid Supply Corporation
Goulds Pumps, Inc.
Hanlon-Waters, Inc.
Hercules Motors Corporation
Ingersoll-Rand, Inc.
Mason-Neilan Regulator Company
C. A. Mathey Machine Works
Mattison-Wallack and Company
Metric Metal Works
Midwest Piping and Supply Company
Moorlane Company
National Petroleum News
National Supply Company
National Tank Company
Naylor Pipe Company
North American Car Corporation
The Oil and Gas Journal
Petroleum Engineering, Inc.
The Petroleum Engineer
Pittsburgh Equitable Meter Company
The Refiner and Natural Gasoline Manufacturer
The Refinery Supply Company
C. J. Tagliabue Manufacturing Company
Taylor Instrument Company
Tulsa Boiler & Machinery Company
Victaulic Company of America
Vinson Supply Company
Webster Engineering Company
Westcott & Greis, Inc.
Woobank Pump & Machinery Company
Worthington Machinery Corp. of Oklahoma
Wyatt Metal & Boiler Works
John Zink Burner Company

Activities OF EQUIPMENT MANUFACTURERS

TO SHOW WELDED HEADER—Crane technique in welding will be illustrated by a welded header to be shown in the exhibit of Crane Co., Chicago, at the tenth International Petroleum Exposition at Tulsa May 14-21. The company will have five booths.

W. H. Pape, manager of the valve and fittings department, and R. A. Hendrickson, manager of the oil sales division, will head the Crane delegation of nine at the show. Others in attendance will include Roy E. Kohn of St. Louis offices; A. J. Armstrong, Little Rock; L. C. Binda of Oklahoma City; N. S. Edwards, Kansas City; T. S. Jones, Tulsa; and H. L. Schultz, Wichita.

Among new products for the oil industry to be shown will be hammer-lug forged steel unions, Crane bar stock valves and Crane Malleable iron globe valves.

* * *

MOTOR TRUCK EXHIBIT—A new permanent building, together with adjoining lot, will be devoted to a greatly enlarged International Harvester exhibit at this year's International Petroleum Exposition in Tulsa May 14-21. North of the building is a lot in which heavier types of equipment, especially a variety of tractors and motor trucks rigged up for oil-field work, will be shown.

Half of the building will be devoted to motor trucks. The other half of the interior exhibit includes several sizes of International power units.

About one half of the outside space will also be devoted to motor trucks equipped for heavy-duty oil-field work. The southern part of the outdoor exhibit consists of two wheel-type International Tractors.

R. W. Elliott, manager of the International Harvester branch in Tulsa will be assisted by salesmen from ten neighboring branches. Various branch managers and quite a number of sales executives from the main Chicago office are also planning to attend.

* * *

Proportioneers, Inc., Providence, will have a display at the Tulsa Oil Expo in Space 133 in the Texas Building. The display will include refinery treating equipment and various types of metering and control equipment manufactured by Builders Iron Foundry. The booth will be one of a group in charge of Bailie Vinson, Tulsa. R. P. Lowe, sales manager, will be in attendance.

* * *

The Key Co., East St. Louis, Ill., will show its complete line of refinery return bend fittings at the Tulsa Oil Expo. Several recent developments in high pressure and high temperature service will be featured. These fittings were developed for use in polymerization and hydrogenation plants.

* * *

FIRE EXTINGUISHERS—Among four new fire extinguishers to be displayed by Pyrene Mfg. Co., Newark, N. J., at the International Petroleum Exposition in Tulsa, May 14-21, will be a one-piece, seamless, drawn shell, 2½-gallon Phomene foam type extinguisher. A new large size Phomaire play pipe designed to produce 500 to 750 gallons of foam per minute will also be shown for the first time.

* * *

EXHIBIT. An exhibit depicting the contributions of the chemical manufacturing industry to the petroleum industry will be shown by the E. I. du Pont de Nemours & Co. at the International Petroleum Exposition at Tulsa, May 14-21. The display will be in the Oklahoma building, spaces 159 to 164.

EXHIBITS—Oakite Products, Inc., New York, N. Y., makers of cleaning compounds, will exhibit in its Booth Nos. 10 and 11 at the International Petroleum Exposition methods that have been developed for cleaning the water jackets of Diesel engines. Oakite Compound No. 32, the makers report. can be circulated to rid the system of rust and scale deposits so that full heat transfer capacity is restored. The Hot Flow-On Method of stripping paint from oil storage tanks and heat exchanger cleaning methods will be shown.

The booth will be in charge of J. A. Carter, assistant manager; and will be attended by J. C. Leonard, Chicago division manager; J. R. Whyte, Tulsa representative; W. A. Dowen, Houston representative and A. W. Schulte, Dallas representative.

* * *

Haynes Stellite Co. will display alloys for resistance to abrasion and corrosion in its exhibit at the Tulsa Oil Exposition May 14-21, at Tulsa. Exhibit areas 6, 7, 8, and 9 in the California Building will be occupied with associated units of Union Carbide & Carbon Corp. While oil field applications will be emphasized, alloys for refinery equipment handling strong mineral acids will also be shown. These will include pump and valve parts, piping, and containers.

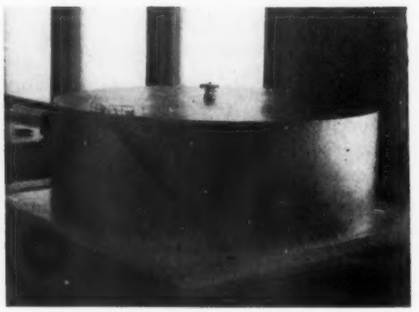
* * *

The Foxboro Co. will demonstrate the ability of modern instrumentation to "crack hard nuts" in control problems at its exhibit at the Tulsa Expo May 14-21. A Foxboro Stabilflo valve, operating with a Valvactor mechanism, will show the exactness of adjustment by controlling an assembly. A demonstration of the Foxboro pneumatic remote transmission system will also be featured.

Attendants at Booths 4 and 5 in the Scientific Building will be J. B. McMahon, manager of the control division, G. B. Lane, manager of the Dallas branch office, C. L. Bryan, H. G. Griffith, and L. Parten.

* * *

To be used in the display in the Hall of Science at the International Petroleum Exposition at Tulsa, May 14 to 21 is this 1:30 scale model of a 100-foot diameter tank 40 feet high. The model was built by Chicago Bridge & Iron Co.



and is equipped with a Wiggins working breather roof, the roof bulging up and down in the period of a minute approximately the amount it would flex on a hot summer day.

REFINERY MOTORS—The first two motors of their type and construction, involving what is said to be one of the most unusual induction motor devices ever built, have been constructed by General Electric Co., Schenectady, for oil refinery service. These are 2-pole, 50-cycle induction motors, rated 1000 Hp. at 3000 rpm. and are being installed for Richfield Oil Corp. at Watson, Cal.

Inasmuch as such size of motor is beyond the range of labelled explosion-proof design, these motors are provided with a closed-circuit system of directional ventilation incorporating surface air coolers for removing heat, as well as a valve arrangement for continuously injecting a small amount of inert gas. Pumps continuously force lubricants to bearings and maintain a liquid seal.

* * *

PACKINGS—A new cloth-bound manual and illustrated data book on mechanical packings for every kind of service has been published recently by Linear Packing & Rubber Co., Philadelphia. A carefully compiled chart of service recommendations is included as a sales help to supply salesmen.

* * *

Wheeling Steel Corp., Wheeling, announces appointment of K. P. Fuhrmann as manager of its newly created barrel and range boiler division. Offices are in Portsmouth, Ohio. Sales of small containers will continue to be handled by the Wheeling Corrugating Co.

* * *

W. B. Whenthoff, formerly with the Big Three Welding and Equipment Co., has joined the sales organization of Tube-Turns Inc., as district manager of the Mid-Continent area.

* * *

BOILER WATER CONDITIONING—A new edition of "The Inside Story of Boiler Water Conditioning" has just been published by and is available from Elgin Softener Corp., Elgin, Ill. The brief treatise is aimed to explain in simple non-technical terms the conditions most frequently encountered and to discuss the various methods of softening, treating water and removing concentrations from the boiler.

* * *

CENTRIFUGAL PUMP—A new bulletin describing the Cameron Class GT two-stage centrifugal pump was issued recently by Ingersoll-Rand Co., 11 Broadway, New York. The pumps are ball bearing units available in capacities from 100 to 2200 gallons per minute for discharged heads up to 800 feet (350 pounds per square inch).

* * *

Petroleum Rectifying Co. (Cal.) announces the appointment of William Woelflin as California district manager. Mr. Woelflin has been with Petreco 12 years and is well known through his technical articles on various publications.

* * *

W. K. Mellon, vice-president of Petroleum Rectifying Co. of Cal., left Los Angeles April 9 for an extended business trip through various oil producing areas of the country. He expects to spend several weeks in Houston before continuing on through the Mid-Continent and Great Lakes sections, and to a number of eastern cities. Return to Los Angeles is scheduled for about June 1.

* * *

William E. Soden, chief engineer, Marcus Hook refinery of Sun Oil Co., has been transferred to the home office of the company in Philadelphia.

* * *

Frank J. O'Brien, vice president in charge of manufacturing, and F. Gladden Searle, vice president in charge of sales, have been elected directors of Continental Can Co.

OCECO *Vents..*

set the performance records!

• Oceco vents record their efficiency with black ink on the ledgers. They control tank breathing . . . prevent the free circulation of air . . . and minimize evaporation losses. On one test an Oceco vent saved losses of 2.42 bbls. of gasoline per day, yielded a return of more than $2900 from the $138.00 investment. Similar savings are an every day occurance with Oceco fittings. Equip your storage and barge tanks with Oceco vents. Standard sizes for any tank requirement and any pressure. Write for descriptive literature.

Specify
OCECO FITTINGS
your tanks deserve the best

OCECO *Fittings*

THE JOHNSTON & JENNINGS CO.
OCECO DIVISION
885 Addison Road • Cleveland, Ohio
Engineering and Sales Services: NEW YORK • CHICAGO • PITTSBURGH
BEAUMONT, TEXAS • TULSA, OKLAHOMA • LOS ANGELES • OAKLAND, CALIF.

INDEX TO ADVERTISERS

Refining Technology Section

This index is published as a convenience to the reader. Every care is taken to make it accurate, but National Petroleum News assumes no responsibility for errors or omissions

Alco Products Div. of American Locomotive Co. . . R-227
Badger & Sons Co., E. B. R-213
Chicago Bridge & Iron Co. R-219
Crane Co. R-211
Clark Bros. Co. R-208-209
Dresser Engineering Co. . . . . .
duPont de Nemours & Co., E. I. R-215
Edeleanu Co., Ltd. . . . . .
Gasoline Products Co. . . . . .
Gray Processes Corp. R-222
Hanlon-Buchanan, Inc. . . . . .
Johnston & Jennings Co. R-231
Kellogg Co., M. W. . . . . Insert
Koppers Co. . . . . .
Lummus Co. . . . . .
Monsanto Chemical Co. . . . . .
Natural Gasoline Supply Men's Assoc. R-229
Nichols Copper Co. . . . . .
Perco, Inc. . . . . .
Petroleum Rectifying Co. of Calif. R-232
Polymerization Process Corp. . . . . .
Shand & Jurs Co. . . . . .
Sharples Specialty Co. . . . . .
Sun Shipbuilding & Dry Dock Co. R-205
Texaco Development Corp. . . . . .
Universal Oil Products Co. 27

(See also page 64)

DIFFICULTIES TRACEABLE TO *Salts* IN PETROLEUM

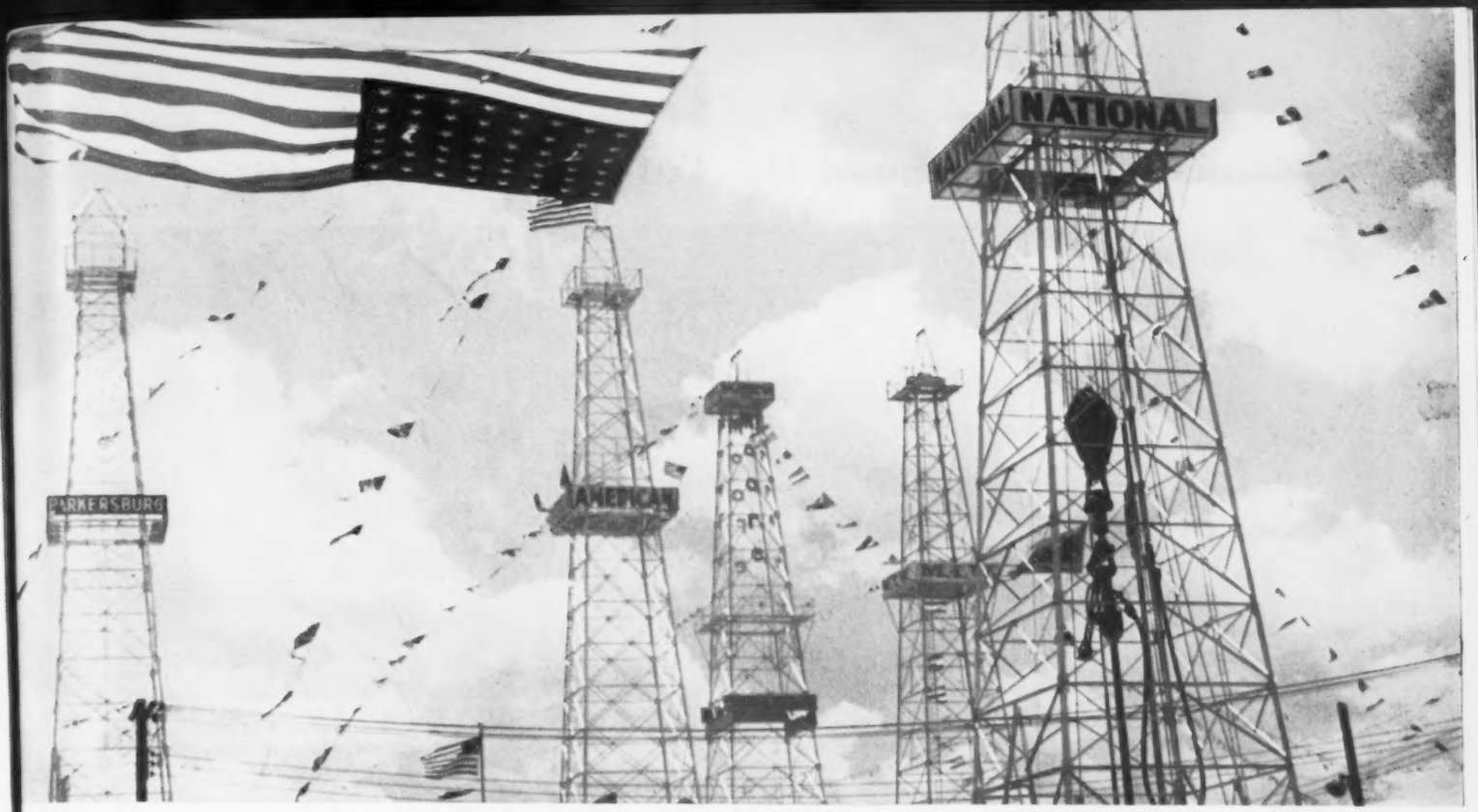
Refiners who are experiencing any of the difficulties enumerated above will find it extremely profitable to investigate the Petreco Electromatic De-Salting Process.

It has been definitely determined that salts in crude charging stocks are very often responsible for these problems. In many cases the Petreco process has solved them efficiently, economically and permanently.

Refiners throughout the country who are using Petreco Electromatic De-Salters are saving thousands of dollars every month by increasing onstream time, reducing repair and replacement costs, and improving the quality of asphalt and residual fuel oils.

Petreco Engineers are available to assist in determining the causes of your refining problems, and solving them if they are caused by salts. Consultations and preliminary investigations involve no cost or obligation.

PETROLEUM RECTIFYING COMPANY OF CALIFORNIA
General Offices: 530 West Sixth Street, Los Angeles, California
Branch Office: Houston, Texas. Branches and Service Men in Principal Oil Fields



Aloft the Tulsa Oil Exposition is mostly derricks, flags and bunting. On the grounds, however, in special buildings and in the Exposition buildings are hundreds of exhibits that are an education in the technical advances in methods and processes being made in all branches of the industry. This photo was of the 1936 Expo

Tulsa Expo Biggest Ever

THE oil industry's greatest educational feature — the International Petroleum Exposition — opens its gates for the tenth time in Tulsa on May 14 with a show that will be 50 per cent greater than any previous one.

For eight days thousands of persons either in the industry or interested in it will throng the exposition daily. Not a single one of those persons will leave the grounds without having received a more liberal education, without having learned by seeing something new about the petroleum industry. The nine previous expositions have drawn a total attendance of 722,988.

The first Exposition, held in the street beside Tulsa's Convention Hall in 1923, could be placed almost in toto inside the new air cooled restaurant that has been built on the Exposition's grounds for this year's show. That first Exposition had 27 exhibitors and drew an attendance of 14,000. Visitors to Tulsa had little difficulty finding living accommodations then.

The 1924 Exposition had 86 exhibitors and an attendance of 27,000. The number of exhibitors reached 102 for the 1925 show, with 30,512 persons attending. The 1927 show had 67,832 persons attending, with 189 exhibitors.

Then came the 1928 show, with 258 exhibitors and 89,316 total attendance. When the 1929 show passed into history the attendance had exceeded the 100,000 mark and there had been 289 exhibitors. In 1930 the attendance moved up to 112,605 with 312 exhibitors. The 1934 show had 316 exhibitors and an attendance of 121,398, and the 1936 show drew 152,001 persons to see the displays of 377 exhibitors.

This year's Exposition will have more than 500 exhibitors. The attendance is expected to reach 200,000 if weather conditions are favorable.

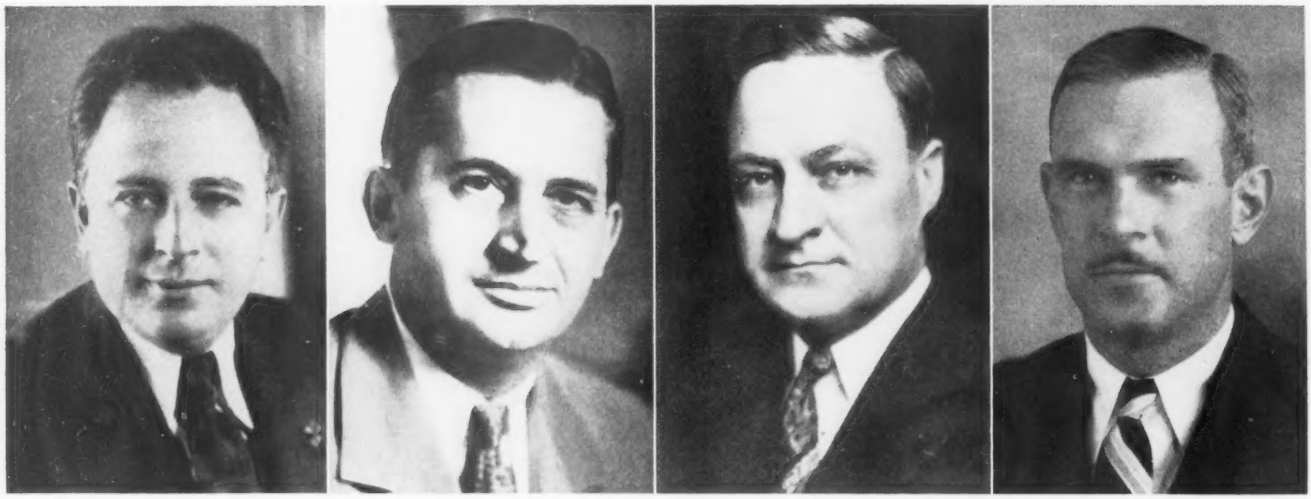
Unfortunately, the idea has grown along with the Exposition's development that it is held primarily for the further education of the refining and producing branches of the petroleum industry. The marketing branch of

Manages Tulsa Expo

• • •

William B. Way became manager of the Tulsa Oil Exposition in 1929 and has held that position since. Under his direction the oil show has grown both in the number of exhibits and in the size and facilities of its permanent plant until it is the largest industrial exhibit in the world. He had had previous experience in managing industrial displays, being secretary-treasurer of the Natural Gas Association of America and handling the annual exhibits of equipment held in conjunction with its conventions. Besides his work as Oil Expo manager, Way manages radio station KVOO in Tulsa

Chairmen of Some of the Tulsa Expo Committees



R. W. McDowell, vice president Mid-Continent Petroleum Corp., Tulsa, chairman of the Tulsa Expo marketing committee; J. A. La Fortune, vice president, Warren Petroleum Co., Tulsa, chairman natural gasoline committee; H. M. Stalcup, vice president, Skelly Oil Co., Tulsa, chairman production committee; J. D. McCamey, Carter Oil Co., Tulsa, chairman Exposition Safety Day committee

the industry has shown only passing interest in spite of the repeated efforts of the Exposition officials and some of the equipment manufacturers to get that branch to take a more active part.

This year's Exposition, however, will have a larger number of marketing exhibits than any previous Exposition. Two hundred and eight manufacturers will display the latest developments, methods and new and improved equipment of interest to members of the marketing division of the petroleum industry. An entire building has been assigned to the displays of these manufacturers, and that building has been named the Marketers' Building. The Marketing Committee, headed by R. W. McDowell, vice president of Mid-Continent Petroleum Corp., has set aside Wednesday, May 18, as Marketers' Day at the Exposition.

Advance information from Exposition officials as to the equipment that will be displayed for marketers shows that virtually nothing has been omitted. There will be improved cleaning materials for maintenance of tank trucks, service stations and bulk plants; safety valves and control valves; breather, balloon and pontoon roof tanks for motor fuel storage; special storage racks; testing instruments and meters of various kinds.

The new air-cooled restaurant-cafe-cafeteria is the pride of the Exposition officials and will contribute greatly to the comfort of visitors. The building was not completed when the Exposition's Transportation Committee inspected the grounds recently but the committeemen were given a "preview." Here they are grouped in front of the main entrance

There will be displayed all types of containers; check valves to eliminate losses when unloading from the bottom of tank cars; all types of pumps, air compressors, car washers, service floodlights and sign reflectors.

The latest developments in gasoline hose for marine terminals, for curb, pump and airplane refueling service, for suction and discharge lines will be shown.

Exposition officials report that 303 of the manufacturers exhibiting at the show will have displays of particular interest to the refining industry. Some of these of course will appeal to visitors from other branches of the industry. The outstanding commercial processes and new developments of the past two years will be displayed.

There also will be the exhibit of the Chicago Museum of Science and Industry, which has been brought to Tulsa for the Exposition. One of the features of this exhibit is a 30-foot working model of a modern refinery. The bubble towers, made of glass, show how the fractional distillations of the crude oil vapors is accomplished.

Approximately 400 exhibitors will have equipment on display that will interest the producing branch of the industry. Just as in the other branches the outstanding developments of the past two years in the production of oil also will be shown. In addition, the scientific exhibit brought from Chicago contains several displays pertaining to production, transportation and exploration of oil.

Then there will be the exhibits of interest to the pipeline division, the natural gasoline industry, and the exploration section of the industry.

A large number of exhibits this year will be of the "moving" type—they will be centered around actual demonstrations of the equipment being shown. In many instances where

The gasoline pool

It isn't a buying pool today

It isn't a swimming pool

It's a storage pool

There is too much gasoline in storage and most of it is straight run

If you make straight run gasoline it has to go to storage—you can't sell much of it

And every gallon that goes into the storage pool makes it that much nearer a drowning pool

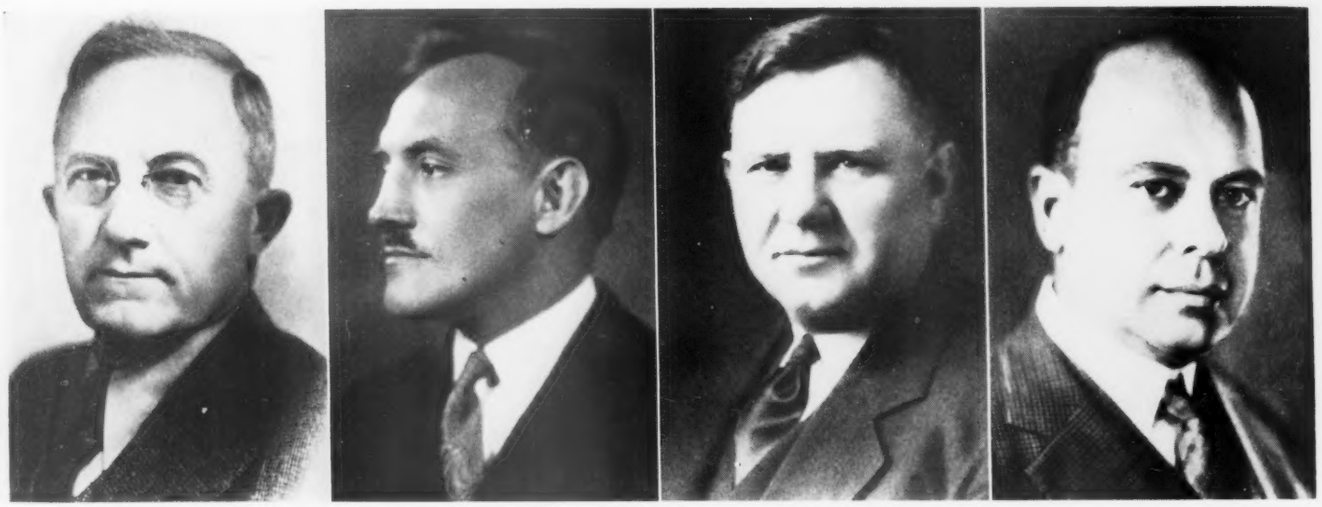
Please remember this—

Dubbscracked gasoline goes to market when straight run gasoline goes to storage

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

Oil Men Contribute to the Success of the Expo



C. M. Boggs, president Kanotex Refining Co., Arkansas City, Kans., chairman Expo refining committee; Dr. Gustave Egloff, director of research, Universal Oil Products Co., Chicago, chairman scientific and technical committee; H. R. Gruber, vice president Union Wire Rope Corp., Tulsa, chairman Old Timers committee; A. F. Winn, traffic manager, Skelly Oil Co., Tulsa, chairman transportation committee

the equipment itself is too large for actual demonstration, working models will be used.

Even the veteran visitors will be surprised this year when they see the Exposition grounds. The officials have spent approximately $250,000 for new buildings and modernization of old ones.

New fronts have been placed on the largest exhibit buildings. The main entrances have been redesigned to harmonize with the change in building fronts. Several exhibitors having their own buildings have revamped them to harmonize with the general architectural scheme.

The one improvement that will appeal, probably more than any other one, to the oil men who "make" the Exposition year after year, is the new air-cooled, brick, concrete and steel constructed restaurant. It is undoubtedly the architectural triumph of the 1938 show. No more will the show visitors have to crowd into the hot, stuffy, sheet iron sided building that the Exposition outgrew years ago. The new restaurant is large — it will accommodate the crowds easily and it has been so designed that service can be given efficiently.

More visitors will travel to and from the Exposition this year by automobile, Exposition officials say. They have found, either by first hand experience or from those who have tried the experiment, that driving to the Exposition is an exceptionally pleasant way of getting to Tulsa.

Travel bureaus report that all the main highways leading into Tulsa now are devoid of detours and all the highways are paved. Motorists can make passenger train time or better — and those from the north and east will find this section of the country right in the midst of its late spring, with the temperature mild and the countryside at its best.

While transportation facilities are adequate from the business district of Tulsa to the Exposition grounds, visitors have found from experience that an automobile is exceptionally convenient to drive to and from the grounds. There is ample parking space adjacent. One does not have to walk more than 100 yards to reach an entrance gate. For those visitors who have living accommodations in the residential section of the city an automobile is almost a necessity.

A number of field trips have been planned for this year in connection with the Exposition and an automobile will come in handy in making those journeys.

The Exposition this year maintained for the first time a full time housing bureau. All rooms available for visitors were listed with this bureau and representatives made inspections of all listings and classified them. As a result the bureau officials have declared definitely that there will be a "room with bath" for every visitor.

The modern new front on the "Oklahoma" exhibit building, just inside the main entrance at the southwest corner of the Exposition grounds. Painters had not yet given the new face its coat of white when this picture was taken

The housing bureau encountered an unusual situation. A large number of civic minded home owners agreed to turn over their dwellings to the bureau. Scores of families will move out of their homes and stay with relatives or take a vacation during the Exposition and their homes will be occupied by Exposition visitors. Many of these homes will be supplied with maid service.

There will be numerous entertainment features during Exposition Week. One of the features, sponsored by the Exposition, will be the "Oil Show Rodeo" at the Tulsa State Fair race track, only a short distance from the Exposition grounds.

COMMANDING COUNTRYWIDE ACCEPTANCE

The new BENNETT Gasoline Pumps that are daily being installed on the locations of progressive operators from coast to coast tell a story that is impressing both the motoring public and the petroleum industry.

It is a story of genuine achievement . . . raising the standard of BALANCED REFINEMENT in gasoline pumps to an unprecedented new high. These new BENNETT Pumps in actual service are objects of admiration . . . customers comment on the beautiful styling; the HARMONISTIC lines with full length convex surfaces; absence of useless ornamentation; and the lustrous sheen of the DURA-MIRRO finish. Owners and attendants say that never before have they operated a pump that performs so quietly and efficiently.

To see the new BENNETT is to understand why it is attracting such widespread and favorable attention. To study its mechanical features is to know why it is the logical pump for you to buy. The new BENNETT is a pump that will give you years of accurate, efficient, trouble-free service . . . with styling that is unmatched for sales appeal and enduring quality. Send for descriptive literature.

SERVICE STATION EQUIPMENT COMPANY

FACTORY AND EXECUTIVE OFFICES - MUSKEGON, MICHIGAN

DIVISION OFFICES: ATLANTA — BOSTON — CHICAGO — DALLAS — DENVER — DETROIT — LOS ANGELES — LOUISVILLE — NEW YORK — PHILADELPHIA — PITTSBURGH — RICHMOND — SAN FRANCISCO — ST. LOUIS — ST. PAUL — FOREIGN DIVISION, 29 BROADWAY, NEW YORK

QUALITY BUILT Bennett

Bennett Means Business

Program For Oil Expo

Tulsa, May 14-21

TULSA, May 2.—The gates at the Exposition grounds will swing open at 9:30 a.m. Saturday, May 14, to inaugurate the Tenth International Petroleum Exposition, by far the largest to date. The official opening ceremony takes place at two the same afternoon. The expo lasts through May 21.

Two prominent oil industry organizations will hold their annual meetings in Tulsa just prior to the Exposition, The Natural Gasoline Association of America meets in convention May 11 to 13. The National Oil Scouts Association has its convention May 12 to 14.

As in past years, each day of the Exposition is designated for some particular branch of the industry. Each day honors two oil states, and has its own directors for the day. The tentative program of Exposition events is as follows:

MAY 14, REFINERS DAY

Directors for the day: Clyde Alexander, R. H. Bartlett, Frank R. Billingslea, Allmand M. Blow, A. F. Bourne, W. M. Bovaird, A. E. Bradshaw, J. H. Brooks, D. E. Buchanan, J. Garfield Buell, E. J. Bullock, C. F. Camp.
Honoring: Arkansas and Kansas.
10 a.m.: Registration opens—Petroleum Engineer Bldg. Registration, "Old Timers", in Replica of Drake Well.
2 p.m.: Opening ceremony.
3 p.m.: Registration, foreign delegates.

MAY 15, NATURAL GASOLINE DAY

Directors: Wm. L. Connelly, R. E. Day, R. O. Dietler, C. P. Dimit, Ray L. Dudley, George A. Dye, Dr. G. Egloff, R. S. Ellison, W. S. Farish, Harold B. Fell, E. R. Filley, W. S. Fitzpatrick..
Honoring: Mississippi, Pennsylvania, Texas.
3 p.m.: Ceremony dedicated to "Old Timers".
7:30 p.m.: Special showing, Hall of Science.

MAY 16, PRODUCTION AND PURCHASING DAY

Directors: J. P. Flanagan, Walter Fleming, C. W. Flint, H. V. Foster, Jacob France, Dr. C. K. Francis, Wirt Franklin, J. H. Gardner, Robert F. Garland, J. Burr Gibbons, Rush Greenslade, Henry Greis.
Honoring: Oklahoma, Tennessee.
12 Noon: Luncheons: Civitan Club, Alvin Hotel; Kiwanis Club, Mayo Hotel.
2 to 4 p.m.: Junior Chamber of Commerce Young Oil Men's trip through Diamond D-X (Mid-Continent Petroleum Corp.) refinery.
7:30 p.m.; Special showing, Hall of Science.
8 p.m.: Oil show rodeo.

MAY 17, PIPELINE DAY; ROYALTY OWNERS DAY

Directors: L. S. Gregory, S. A. Guiberson, Jr., P. D. Hayes, J. M. Hayner, Alf. G. Heggem, J. H. Hill, Frank J. Hinderliter, B. E. Herrigan, Fred W. Insull, Roy B. Jones, A. J. Kerr, P. C. Lauinger.
Honoring: California, Colorado, Louisiana.
12 Noon: Junior Chamber of Commerce luncheon.
1:30 p.m.: Trip to Beggs, Okla. for seismograph demonstration, courtesy of Seismograph Corp.
6 p.m.: Dinner for foreign delegates.
7:30 p.m.: Royalty Owners dinner, Mayo Hotel.
7:30 p.m.: Special showing, Hall of Science.
8 p.m.: Oil show rodeo.
8:30 p.m.: Junior Chamber of Commerce, Young Oil Men's party.

MAY 18, DRILLING CONTRACTORS DAY

Directors: John E. Mabee, Clarel B. Mapes, E. B. McFarlin, Joseph R. McGraw, D. F. McMahon, Walter Miller, A. A. Moody, Ed H. Moore, Wm. D. Moorer, C. Morris, W. J. Morris.
Honoring: New Mexico, Utah, Wyoming.
12 Noon: Old Timers luncheon, Shamrock Lodge. Luncheon for Exposition delegates, sponsored by Rotary Club.
7:30 p.m.: Special showing, Hall of Science.
8 p.m.: Oil show rodeo.

MAY 19, MARKETERS DAY

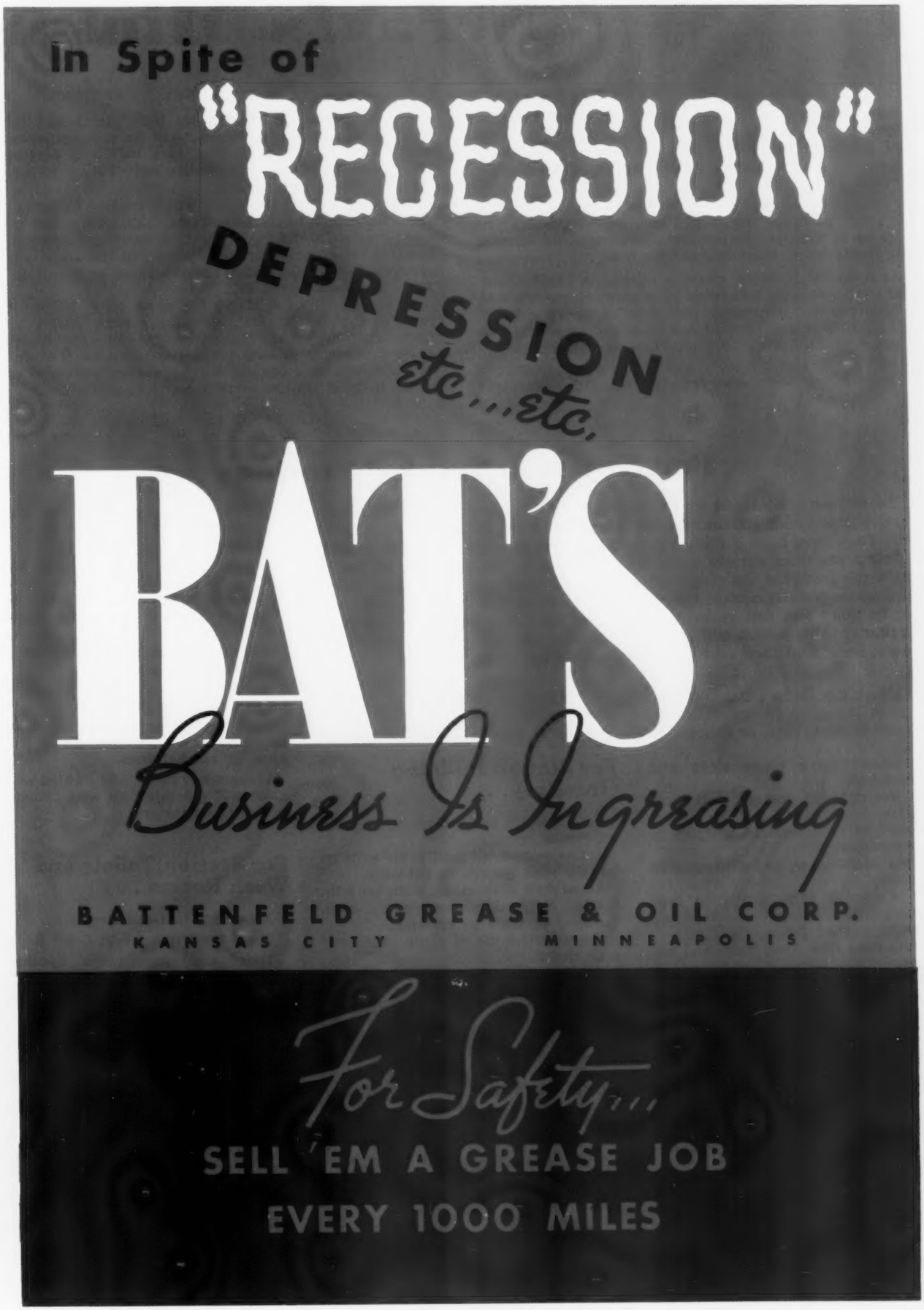
Directors: E. J. Nicklos, A. O. Olson, C. H. Pape, George Parker, F. B. Parriott, A. W. Peake, J. Edgar Pew, Henry L. Phillips, Waite Phillips, Warren C. Platt, Ralph B. Pringle, F. O. Prior.
Honoring: New York, West Virginia.
12 Noon: Safety Conference luncheon.
12:30 p.m.: Old Timers luncheon at Expo grounds.
8 p.m.: Oil show rodeo.

MAY 20, ENGINEERS, P.M.T.A., FIRST AID SAFETY CONTEST, AND PURCHASING AGENTS DAY

Directors: E. B. Reeser, Edward E. Robbins, Harry H. Rogers, G. F. Roeser, E. J. Sadler, Ed H. Salrin, J. H. Satterwhite, W. A. Schlueter, R. C. Sharp, J. S. Sidwell, W. G. Skelly.
Honoring: Indiana, Ohio.
8 a.m.: Golf finals.
9:30 a.m.: Assembling, registration of Purchasing Agents at Headquarters, Tulsa Bldg.
9:30 to 4:30: First Aid contest.
12 Noon: Luncheons: Chamber of Commerce, special exposition program. Old Timers, at Wolfe's farm.
12:30 p.m.: Barbecue luncheon, P.M.T.A., Cooper plant.
2 p.m.: First Aid contest, demonstration, Expo grounds.
4 p.m.: Awarding of medals to Old Timers, Expo grounds.
7:00 p.m.: Purchasing Agents informal dinner, roof garden, Tulsa Club.
7:30 p.m.: First Aid banquet and awarding of medals.
7:30 p.m.: Oil Scout dinner, cafeteria.
7:30 p.m.: P.M.T.A. dinner meeting, Mayo Hotel.
7:30 p.m.: Special showing, Hall of Science.
8 p.m.: Oil show rodeo.

MAY 21, GENERAL OIL INDUSTRY DAY

Directors: Earl Sneed, Hugh Stalcup, O. C. Staples, Jay P. Walker, M. F. Waters, T. R. Weymouth, H. C. Weiss, Frank Wolfe, H. F. Worley.
Honoring: Illinois, Kentucky, Michigan, Missouri.
12 Noon: Luncheon, Purchasing Agents—Oil Company Buyers' group, National Assn. of Purchasing Agents, Roof Garden, Tulsa Club.
7:30 p.m.: Special showing, Hall of Science.
8 p.m.: Oil show rodeo.


In Spite of
"RECESSION"
DEPRESSION
etc.,,,etc.
BAT'S
Business Is Ingreasing
BATTENFELD GREASE & OIL CORP.
KANSAS CITY MINNEAPOLIS
For Safety,,,
SELL 'EM A GREASE JOB
EVERY 1000 MILES

N.P.N.'s Minimum P

● On this and the following page are published NATIONAL PETROLEUM NEWS Minimum Profit Standards for bulk plants, for tank trucks used in the delivery of petroleum products, for service station operations and also for service station appearance.

These standards are one part of N. P. N.'s spring rehabilitation program for oil marketing companies, to help them in maintaining the low operating costs in marketing necessary to meet competition today.

As a means to bring about a minimum profit standard of costs for their individual bulk plant operations and truck operations, marketers will find of great aid the N. P. N. Bulk Plant Inspection Forms published on several pages of its April 27th Bulk Plant and Truck Inspection issue.

These forms were designed to help the bulk plant owner to personally inspect his bulk plants and trucks, and examine and check up in detail on this equipment, as the first step towards making sure that it is performing at its highest efficiency and thus contributing to low operating costs.

Readers will find articles which explain in detail how the Minimum Profit Standards for bulk plants and trucks were arrived at in the April 13th issue of NATIONAL PETROLEUM NEWS, starting on page 25 and the standards for service station operations are described in detail in the April 20th issue, page 25.

Starting with the March 9th issue, N. P. N. presented its Minimum Profit Standards for service station cleanliness, pointing out that the government's campaign against venereal disease made necessary on the part of oil marketers this coming touring season increased effort to see that the station toilets were clean and sanitary.

For Nation's Service Stations

The following Minimum Profit Standards, for appearance and cleanliness of service stations the country over, are offered by NATIONAL PETROLEUM NEWS. They have been published in earlier issues in connection with articles and statements from various authorities to bring to the attention of the oil industry the fact that the public is becoming aroused against unclean toilets at stations as possibly unsafe toilets. As a result of this growing public education in toilet and rest room sanitation, an increasing proportion of gasoline gallonage this season will go to the stations which, by their outward appearance, show that their rest rooms and toilets are clean.

For Station Site . . .

No empty cans, rags, or rubbish on drive.

Curb and drive edges clean and whitewashed.

No wet or dried grease or oil spots on drive.

Floodlight reflectors clean, lights in good condition.

Pump island clean and whitewashed frequently.

No discarded cans, pails, or rags on pump island.

Pumps washed frequently.

Pump hose free from leaks and not frayed.

Pump globes and lights in good condition and clean.

Fence, wall, hedge, or garden in well kept condition.

Air hose picked up and in good working order.

Curb and street signs freshly painted and well lighted.

Fill box openings painted and free of dirt.

For Station Building (Exterior) . . .

All unsightly and poorly painted signs eliminated.

Building surface free from splatters.

No chipped or broken exterior wall surfaces.

Roof in good condition.

All empty or unkept cans, barrels or boxes out of sight.

Windows clean.

For Station Building (Interior) . . .

Walls, floors and ceiling clean, with no grease spots.

Office equipment well kept, with no loosely filed papers in evidence.

Manager's desk clean, with no milk bottles, coffee cups, newspapers, rags, lunches, or tools in evidence.

Conservative use of signs, cards and wall charts.

Attendants' street clothing and miscellaneous stock kept out of sight in closet or storage room.

Pit or lift well cleaned after each job.

Lubritorium floor cleaned after each job.

Lubritorium walls, ceiling and floor well painted.

Stock of tires, batteries, and accessories neatly arranged and **Clean.**

Work bench cleaned off after each job and tools put in proper place.

Grease guns in proper place on clean rack when not in use.

High-boys with no oil spillage on top, front or sides.

Container for oily rags and rubbish freshly painted and with a lid or self-closing top.

Waste basket in office.

Comfortable and **Clean** chairs for customers.

Window displays that are timely and not piles of a mixture of winter and summer items.

All miscellaneous items, not necessary to the immediate job of serving customers, out of sight, including such items as brooms, mops, step ladders, and overalls.

Lamp bulbs in good condition and light fixtures clean.

Lubritorium and other service bay entrances unobstructed.

No odds and ends lying around, such as old second-hand tires, scrap parts, junk, or old batteries.

Compressor clean, and located where noise will not interfere with conversation with customers.

For Station Toilets and Wash Rooms . . .

All toilets in **Good Repair.**

Wash bowl fixtures in **Good Repair.**

Toilet and wash bowls **Spotlessly clean.**

Toilet seat freshly painted and clean.

Floors, walls and ceiling clean.

No litter in the rooms.

Do not use rest rooms to store **Anything.**

Rooms and fixtures inspected, **Frequently Each Day.**

Clean rest rooms at least **Once a Day.**

Supply soap and towels (paper towels at least).

Rooms should always **Smell Clean.**

For Personnel . . .

Uniforms and caps **Clean.**

Attendants clean-shaven.

No dirty rags in attendants' pockets.

Profit Standards

For Bulk Plants, Trucks, Service Stations

MINIMUM PROFIT STANDARDS

Bulk Plant, 40,000 Gals. Storage

Monthly Operating Expenses for Plant		Based On Throughput of 25,000 Gals. A Month Cts. Per Gal.	Based On Throughput of 30,000 Gals. A Month Cts. Per Gal.	Based On Throughput of 40,000 Gals. A Month Cts. Per Gal.
Light, heat, power and water	$ 10	0.04	0.033	0.025
Interest on investment	15	0.06	0.05	0.0375
Insurance	10	0.04	0.033	0.025
Repairs and maintenance	10	0.04	0.033	0.025
Obsolescence and depreciation	16	0.064	0.053	0.04
Shortage and losses	10	0.04	0.033	0.025
Taxes, license, inspection	25	0.10	0.083	0.0625
Miscellaneous	10	0.04	0.033	0.025
Total	$106	0.424 cts.	0.353 cts.	0.265 cts.

MINIMUM PROFIT STANDARDS

Bulk Plant, 60,000 Gals. Storage

Monthly Operating Expenses for Plant		Based On Throughput of 40,000 Gals. A Month Cts. Per Gal.	Based On Throughput of 50,000 Gals. A Month Cts. Per Gal.	Based On Throughput of 60,000 Gals. A Month Cts. Per Gal.
Light, heat, power and water	$ 10	0.025	0.02	0.0167
Interest on investment	25	0.0625	0.05	0.0166
Insurance	10	0.025	0.02	0.0417
Repairs and maintenance	10	0.025	0.02	0.0167
Obsolescence and depreciation	28	0.07	0.056	0.0467
Shortage and losses	10	0.025	0.02	0.0166
Taxes, license, inspection	50	0.125	0.10	0.0833
Miscellaneous	10	0.025	0.02	0.0167
Total	$153	0.3825 cts.	0.306 cts.	0.255 cts.

MINIMUM PROFIT STANDARDS

Bulk Plant, 75,000 Gals. Storage

Monthly Operating Expenses for Plant		Based On Throughput of 50,000 Gals. A Month Cts. Per Gal.	Based On Throughput of 60,000 Gals. A Month Cts. Per Gal.	Based On Throughput of 75,000 Gals. A Month Cts. Per Gal.
Light, heat, power and water	$ 15	0.03	0.025	0.020
Interest on investment	36	0.072	0.06	0.048
Wages	125	0.25	0.208	0.167
Insurance	20	0.04	0.033	0.027
Repairs and maintenance	50	0.10	0.083	0.066
Obsolescence and depreciation	40	0.08	0.067	0.053
Shortage and losses	25	0.05	0.042	0.033
Inspection, taxes, license	50	0.10	0.083	0.067
Miscellaneous	25	0.05	0.042	0.033
Total	$386	0.772 cts.	0.643 cts.	0.514 cts.

MINIMUM PROFIT STANDARD

For Neighborhood Station, 5,000-10,000 Gals. Monthly

	Monthly Operating Expenses	Operating Cost Per Gallon — 5000 Gals. Mo.	7500 Gals. Mo.	10,000 Gals. Mo.
Light, heat, phone and water	$35	.7 cts.	.47 cts.	.35 cts.
Rent on land	50	1.0	.67	.5
Interest on investment	33	.66	.44	.33
Wages	200	4.0	2.66	2.0
Insurance	5	.1	.07	.05
Repairs and maintenance	12	.24	.16	.12
Obsolescence and depreciation	46	.92	.61	.46
Shortage and losses	5	.1	.07	.05
Taxes	15	.3	.20	.15
Total	$401	8 cts.	5.3 cts.	4 cts.

MINIMUM PROFIT STANDARD

For Large Station, 15,000-20,000 Gals. Monthly

	Monthly Operating Expenses	Operating Cost Per Gallon — 12,000 Gals. Mo.	15,000 Gals. Mo.	20,000 Gals. Mo.
Light, heat, water, phone	$65	.54 cts	.43 cts.	.325 cts.
Rent on land	66	.55	.44	.33
Interest on investment	73	.61	.49	.365
Wages	450	3.75	3.00	2.25
Insurance	10	.08	.07	.05
Repairs and maintenance	25	.21	.17	.125
Obsolescence and depreciation	85	.71	.56	.425
Shortage and losses	10	.08	.07	.05
Taxes	25	.21	.17	.125
Total	$809	6.7 cts.	5.4 cts.	4 cts.

MINIMUM PROFIT STANDARDS

For Efficient Tank Truck Operation

Comparison of Monthly Operating Costs of a 600-Gallon And a 1000-Gallon Tank Truck Covering 1000 and 2000 Miles

(A composite tabulation based on figures obtained from actual oil company truck operating records)

Items	1000 Miles per Mo. 600-gallon truck	1000 Miles per Mo. 1000-gallon truck	2000 Miles per Mo. 600-gallon truck	2000 Miles per Mo. 1000-gallon truck
Gasoline, oil, grease	$ 21.40	$ 25.80	$ 42.80	$ 51.60
Tires	6.60	8.00	13.20	16.00
Maintenance and repairs	15.00	20.00	30.00	40.00
Insurance	8.20	9.60	8.20	9.60
Driver's wages	100.00	100.00	100.00	100.00
Depreciation	25.00	42.00	25.00	42.00
TOTAL MONTHLY EXPENSE not inc. license, taxes	$176.20	$205.40	$219.20	$259.20
Cost per gallon delivered	.42 cts. (42,000 gallons)	.205 cts. (100,000 gallons)	.52 cts. (42,000 gallons)	.26 cts. (100,000 gallons)
Gallons delivered per mile	42	100	21	50
Cost per mile	17.6 cts.	20.5 cts.	11 cts.	12.9 cts.

Keep Tinsel From Overhead Jobber's Business Motto

By E. L. Barringer
N. P. N. Staff Writer

THE ROYAL OIL & GAS CO. at Gibson City, Ill., is now in its eleventh year as an independent oil jobber and Walter J. Royal, the owner, has just one recipe for business success —hard work and "keeping the tinsel out of the overhead."

The company does business with farmers in a territory from ten to twelve miles around Gibson City and through two company owned and operated service stations, one in Gibson City and one in Paxton, 16 miles east.

The company has always sold petroleum products under its own brand name. The products it sells are bought on the open market, not on contract. The owner of this business sets his own prices, both tank wagon and service station.

To Royal, being "independent" is not a fetish; but, since he owns his own bulk plant, trucks, service stations and the oil products he sells, he doesn't see why he should not set his own prices and thereby make a profit.

Eleven years ago when he came to Gibson City Royal started in business under rather adverse conditions. He had been a farmer, was without oil jobber experience, was 40 years old, and had a family with one son. Competitive conditions in Gibson City were not easy either. Already in operation there was a prosperous independent jobber, and the farm co-operative was just starting a "co-op" oil company.

This picture of Walter J. Royal, independent jobber in Gibson City, Ill., is in keeping with his ideas about the conduct of his business. He has been in business eleven years but he still drives one of his two delivery trucks, in addition to other duties

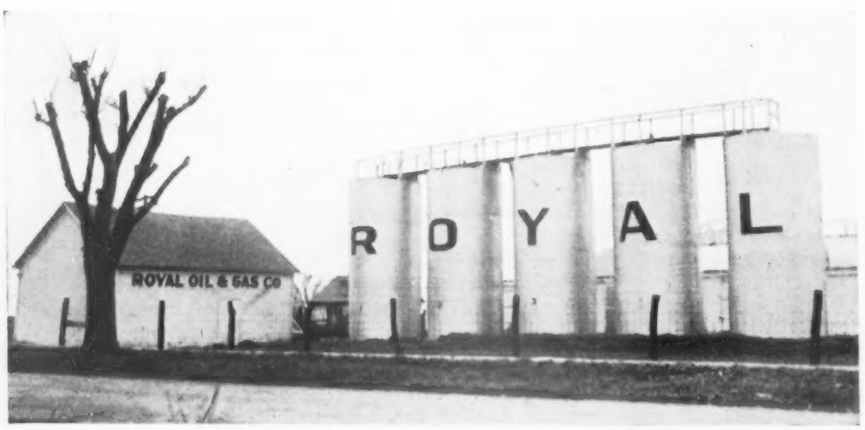
Royal's first bulk plant, obtained from a jobber that had several plants in north-central Illinois, was old and small. But he started in and obtained several curb pump accounts. He kept plugging away and finally got a farm customer. He worked on the idea that, if he delivered good merchandise, at a right price, and through the conduct of his business made the farmer "happy," he would get along in the oil business. He figured a satisfied farm customer would provide good will advertising and get more customers for his tank truck.

THEN he built his Gibson City service station to compete for the motorist's gasoline dollars. At the time he was living in a rented house, but just across the street on a corner a small home was available. With money borrowed at the bank Royal bought the property and moved in. On the corner he built a small building, put in several pumps, and had a service station.

As the years passed he added to the house, built more living quarters on the rear and enclosed a front porch. The station building was enlarged also. A drain pit was built in the rear. The latest improvement was an all concrete drive, and Royal grabbed a shovel and dug the entire foundation himself.

Getting started with a service station was not an easy affair either. Royal recalls getting out of bed at 3 a. m. to start working at the bulk plant. Between 6 and 7 he opened the station. Then the helper came on at 7 and Royal had time for breakfast. After working on a tank truck until noon, Royal, with the help of his wife, tended the station while the helper had dinner. He recalls that many a time, while eating his dinner, he was interrupted to drain a crankcase.

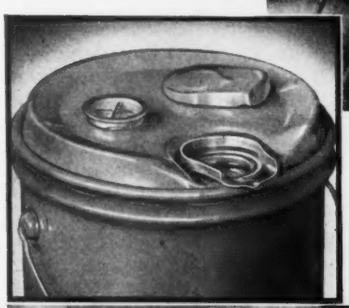
Royal now has a payroll of five, and the books are kept by Mrs. Royal at the office in his home, adjoining the Gibson City service station. The com-



Good housekeeping is prominent at the bulk plant of the Royal Oil & Gas Co. at Gibson City, Ill. The tanks are painted every other year. One of the warehouse buildings was made from two old railroad box cars which cost about $200 when they were placed on a foundation

It's TAMPER-PROOF

Wheeling
CORRUGATING COMPANY



when you pack in . . .
WHEELING STEEL CONTAINERS

●Once you lock your product under the seal of one of Wheeling's many patented steel containers . . . it's safe . . . insured against tampering, substitution and refills. Each sealing device is readily removable for dispensing the contents. Yet when only partially emptied, air-tight closures are provided to prevent contamination.

Wheeling Steel Containers . . . 1 to 70 gallon capacities . . . with a wide variety of closures, meet every packaging need.

Our research department offers you a thoroughly equipped service in developing special linings for containers to protect your particular products.

Write direct or to one of the nearest branch offices and we will be pleased to apply time and study to your shipping problems.

Water-thin liquids as well as very heavy semi-liquids can be poured easily from the Wheeling Full-Flow Pail. The dome top (see upper illustration) has a cover-all cap to protect spout and a cam cap for resealing.

NEW YORK · CHICAGO · BUFFALO · ST. LOUIS · PHILADELPHIA · BALTIMORE

WHEELING CORRUGATING COMPANY
STEEL CONTAINER DIVISION
WHEELING, WEST VIRGINIA

CINCINNATI · ATLANTA · BOSTON · MINNEAPOLIS · COLUMBUS · CLEVELAND · DETROIT

This 368-gallon demountable tank on a half ton truck is a new venture by the Royal Oil & Gas Co. By unfastening two wing nuts at the bucket compartment the tank can be removed, leaving a stake body for hauling drums or other merchandise

pany has a few gilt edge credit accounts, but most of the business is cash, right on delivery. Credit losses in 11 years have been less than $100.

The only expansion undertaken was building the service station over in Paxton. Royal had one experience, while a farmer, on taking a fling at easy money and he keeps that experience in mind when thoughts arise for a larger company than one man can handle.

Just before this country entered the World war Royal had stocked his rented farm with cattle. He hoped to cash in on war inflation, and he did. The bank granted a sizable loan to plunge in the cattle venture. As soon as prices climbed, however, he sold enough cattle and laid the cash on the bank president's desk to cover all the notes. Then he got out of debt and stayed out. When the boom ended he was not caught, as were other farmers, wishing they had paid off their notes when their pockets were stuffed with money.

So Royal is keeping his business small, small enough for one man to manage and he is content with expanding into one neighboring town.

He also keeps his personal affairs trim and without flossy overhead. He continues to live in the house beside the service station, and has added modern conveniences for a comfortable living. He still drives a low priced car, in keeping with the automobiles of his customers. For the social side of life Royal likes to be with his family, and in the summer they travel. One summer it was to Yellowstone Park. Another year it was up to Canada to see the "Quints." He is now planning some eastern trips for the educational value to his three children.

Royal believes he has been successful in the past because of plain hard work and that he continues his success through still working in the station and driving a truck. He doesn't fear the future, for he knows that hard work built his business and that, if necessary, he could start all over and make a living by hard work.

His bulk plant in Gibson City has five 15,000-gallon storage tanks, the latest one erected in 1933. The tanks are vertical, with a walk across the top and two ladders to the ground.

For a warehouse Royal obtained two old railroad box cars. These cost about $200 when placed on foundations. The pumps are in another warehouse, about 20 by 36 feet. He uses a twin pump unit, driven by a three horsepower electric motor, with 1½ inch lines.

The plant warehouses oils and grease in containers, and two grades of gasoline and one of kerosine in bulk. Three of the five storage tanks are for regular grade gasoline. These tanks are all connected with the same line. The other gasoline, third grade, and the kerosine tank have separate lines from the pump. Kerosine has its own pump and line to storage and to the truck loading dock, to prevent any error in handling the product through the plant.

All bulk products are metered from the plant to trucks. One meter is for kerosine, the other for gasoline, and every gallon leaving the plant is accounted for by checking meter readings against delivery tickets. The truck driver checks readings and tickets every night, and there is another check at the end of the month in closing the books. When Royal is driving a truck the truck driver also meters to the truck tank and checks the tickets at night.

In handling the farm business the company does not operate routes but fills orders that are telephoned in or left at the service station. When possible the company likes to deliver 100 gallons or more in an order.

Deliveries are made from the bulk plant in Gibson City with two tank trucks. One is the new 368-gallon job, the removable tank being mounted on the stake body of a half ton truck. The other is a light truck, with a conventionally mounted 410-gallon tank. While comparative records have not been kept on the two trucks, on account of differences in quantities delivered and distances traveled, Royal has found that the two jobs are capable of handling the business.

The truck with the demountable tank is being tried on farm deliveries. The tank can be removed by unfastening two wing nuts, pulling the tank skids off the truck, and the stake body is ready for delivering drums or package goods, or for hauling farm products.

The truck tank has 368 gallons capacity in three compartments. In the rear is a bucket compartment, large enough to hold two five-gallon measuring cans, three funnels and some small tools. Although the truck cannot trans-

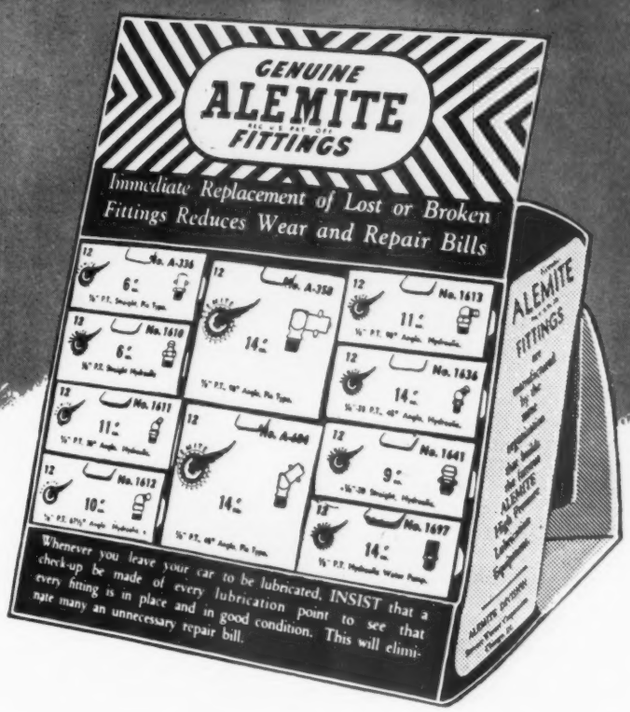
(*Continued on page* 44)

At the right is one of the two service stations owned and operated by the Royal Oil & Gas Co. The building at the left is the Royal residence and also its office

ALEMITE FITTINGS

IN NEW HANDY DISPLAY CARTONS

SHOW YOU *2 Ways to Profit!*


GENUINE
ALEMITE
FITTINGS
Immediate Replacement of Lost or Broken Fittings Reduces Wear and Repair Bills
No. A-336
No. A-350
No. 1613
No. 1610
No. 1636
No. 1611
No. A-604
No. 1641
No. 1612
No. 1697
Whenever you leave your car to be lubricated, INSIST that a check-up be made of every lubrication point to see that every fitting is in place and in good condition. This will eliminate many an unnecessary repair bill.
ALEMITE
FITTINGS

MORE convenient for shop use! More profitable for resale to your customers! *That's what thousands of service station operators are saying about Alemite Fittings in this bright new display carton!* Packed one dozen fittings to the box, ten boxes to the carton, this display gives you all the most commonly used sizes of Alemite Hydraulic Fittings — ten different numbers — always in easy reach.

Instead of selling replacement fittings one at a time, you can sell a dozen in a box, *making a much more profitable sale for you.* Instead of signing a stock order for each fitting needed on cars being serviced, your lubrication man *merely takes a fitting from the box which has been assigned to his use,* and makes the necessary replacement, saving time and red tape.

Ask your Alemite Jobber about Alemite Hydraulic Fittings in the new handy display cartons NOW!

ALEMITE — *A Division of Stewart-Warner Corporation*
1856 Diversey Parkway, Chicago, Illinois
Stewart-Warner-Alemite Corporation of Canada, Ltd., Belleville, Ontario

ALEMITE

REG. U. S. PAT. OFF.

WORLD'S LARGEST MANUFACTURER OF LUBRICATION PRODUCTS

Enjoy Horace Heidt and his Alemite Brigadiers every Tuesday Evening, National Broadcasting Company Coast-to-Coast Network. See local papers for time of broadcast

Sales of Regular "Gas" Gain, At Expense of Third Grade

THE gradual trend toward better grades of gasoline continued during 1937 in the middle west. At the same time oil to gasoline ratios were almost the same as in 1936. This was a halt in a downward trend in recent years.

These facts are revealed in a study by NATIONAL PETROLEUM NEWS of gasoline and oil sales by grades of seven large Mid-Continent refiners and marketers.

The seven companies, through owned and controlled bulk stations, sold 979,200,000 gallons of gasoline in 1937 compared with 949,700,000 gallons in 1936. They sold 26,555,000 gallons of lubricating oil through these same stations compared with 25,879,000 gallons in 1936.

The oil-to-gasoline ratio of the seven companies was 2.71 in 1937 and 2.72 in 1936. The same companies sold 2.96 gallons of oil to 100 gallons of gasoline in 1934 and 2.82 gallons of oil per 100 gallons of gasoline in 1935. The drop last year was thus far less precipitate than in the previous two years.

Oil to gasoline ratios of the seven companies by months in 1937 are compared with those in 1935 in Fig. 1. Detailed figures for three years are given in Table 1.

TABLE 1

Monthly Oil to Gasoline Ratios of Sales of Seven Mid-Continent Companies

	1937	1936	1935
Jan.	2.07	2.07	2.39
Feb.	2.20	2.19	2.38
March	4.59	4.25	4.53
April	3.30	3.33	3.30
May	2.97	2.96	3.14
June	3.06	2.92	3.08
July	2.36	2.58	2.52
Aug.	2.32	2.38	2.42
Sept.	2.91	2.84	3.05
Oct.	2.33	2.39	2.51
Nov.	2.32	2.56	2.55
Dec.	2.34	2.26	2.24
Total	2.71	2.72	2.82

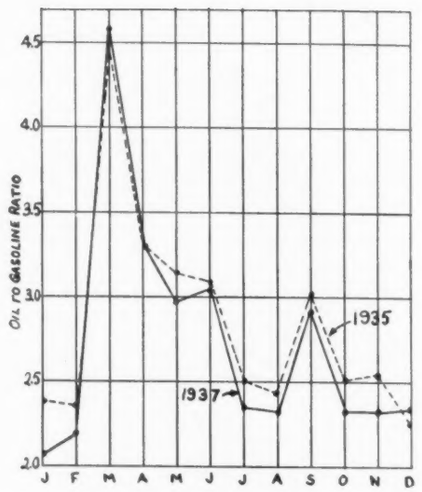


Fig. 1—The ratio of oil to gasoline sales in the middle west has dropped materially since 1935 in most months except in March, when there is still a peak movement from bulk plants to the farm as well as to the retail station. Chart shows ratios of sales of seven Mid-Continent refining and marketing companies through bulk plants

Since these figures show movement from bulk plants rather than retail sales, they embrace farm sales and stocking of service stations at certain seasons. Thus they vary more widely than actual retail sales to motorists. The spring peak of oil sales from bulk plants invariably comes in March in the middle west. March oil sales total nearly 11 per cent of the year's business as farmers prepare for their spring activities and service station operators stock up for the spring change campaign.

Related to gasoline, March sales of oil were by far the highest of the year, exceeding 4.5 per cent. The June peak reaches only about 3 per cent of gasoline but gasoline sales are so much higher in June than in March that there is not much difference between the actual volume of oil sold in the two months. Last year the seven companies sold 3,160,000 gallons of oil in March, 2,861,000 gallons in June and 2,830,000 gallons in September.

Examination of Fig. 1 shows that the loss in oil sales is coming in almost every month except March. The farm trade is buying as much oil as ever. The loss appears to be in automotive oil sales.

As mentioned previously the trend toward better grades of gasoline continued through 1937. Regular gasoline constituted 82.93 per cent of all

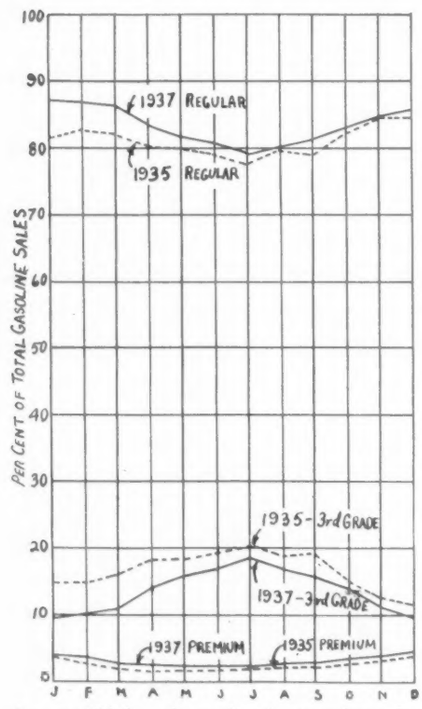


Fig. 2—Third grade gasoline is occupying a less important part of total gasoline sales in the middle west. Both premium and regular gasoline sales are rising steadily. Chart shows analysis of sales through bulk plants by seven Mid-Continent refining and marketing companies

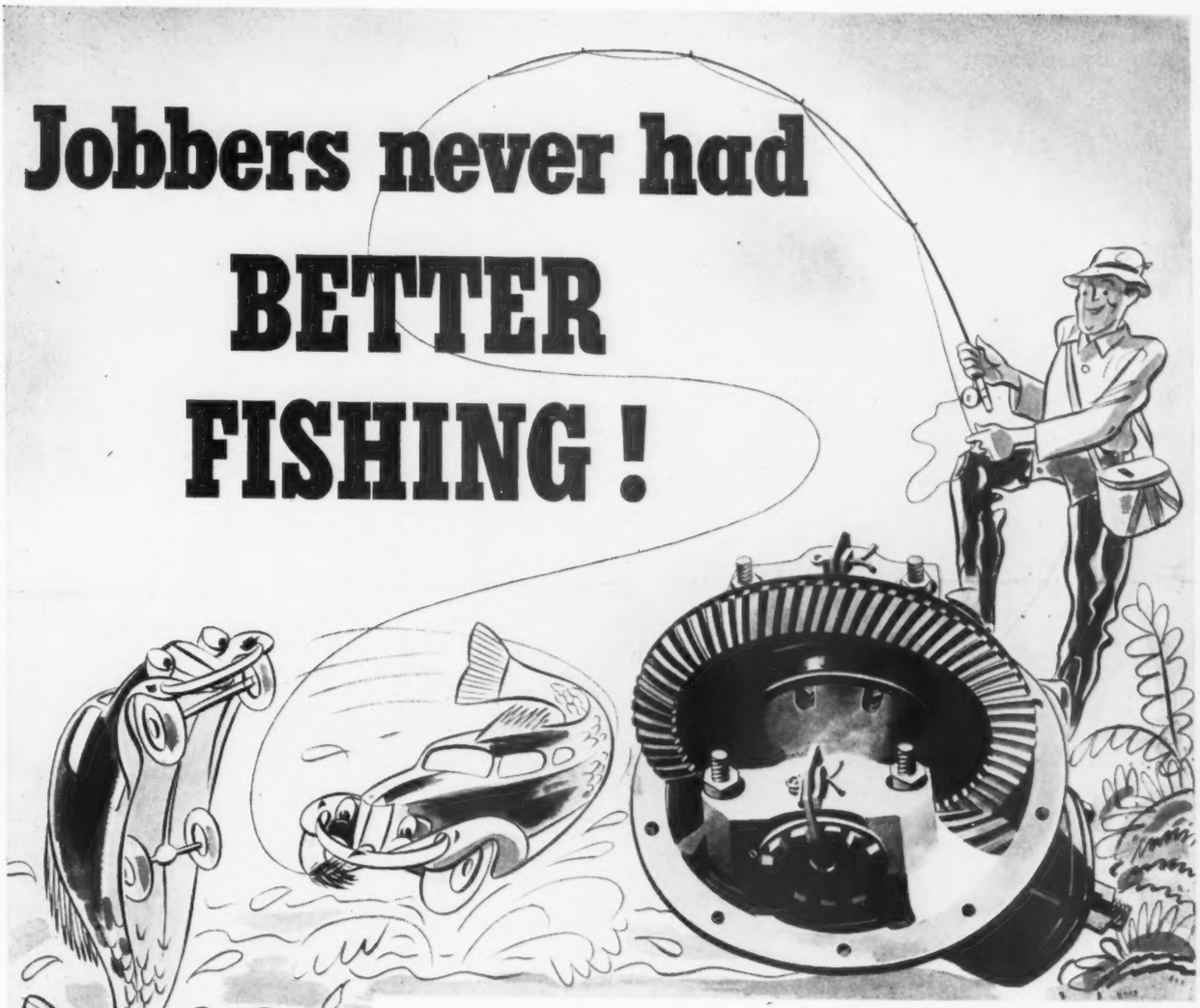
TABLE 2

Analysis of Gasoline Sales of 7 Mid-Continent Refining and Marketing Companies by Grades

(Figures are in per cent of total sales through owned and controlled bulk plants)

	Premium			Regular			Third Grade		
	1937	1936	1935	1937	1936	1935	1937	1936	1935
Jan.	3.96	4.07	3.56	86.75	83.9	81.4	9.27	12.0	15.0
Feb.	3.53	4.99	2.62	86.49	84.6	82.6	9.98	10.4	14.8
March	2.75	2.53	1.93	86.31	84.3	81.9	10.94	13.2	16.2
April	2.48	2.24	1.64	83.49	82.6	80.2	14.03	15.1	18.1
May	2.34	2.10	1.56	81.73	81.3	79.9	15.93	18.6	18.6
June	2.33	2.24	1.62	80.84	80.2	79.0	16.83	17.6	19.4
July	2.38	2.12	1.94	79.13	80.2	77.6	18.49	17.7	20.5
Aug.	2.56	2.29	1.90	80.34	81.5	79.7	17.10	16.2	18.4
Sept.	2.85	2.35	2.08	81.23	81.6	78.7	15.92	16.1	19.2
Oct.	3.27	2.61	2.65	83.11	83.5	82.1	13.62	13.9	15.3
Nov.	3.70	3.15	3.07	80.80	85.5	84.2	11.50	11.4	12.7
Dec.	4.43	3.49	3.52	85.77	85.9	84.5	9.80	10.6	11.9
Total	2.98	2.73	2.31	82.93	82.73	80.83	14.09	14.54	16.81

Jobbers never had BETTER FISHING!



RIGHT now it's the open season on big profits—and for jobbers with the right bait the fishing never was better.

Already over two million cars are hypoid-equipped and must be serviced with a hypoid lubricant. That is one item dealers *must* stock.

Go after the business with Penola Expee Compound —best seller among hypoid lubricants recommended by car makers. . . . Enough pounds sold last year to service every hypoid in use today at least twice. Penola Expee more than meets every specification. Its amazing load-carrying capacity has been demonstrated for over four years in hundreds of thousands of cars.

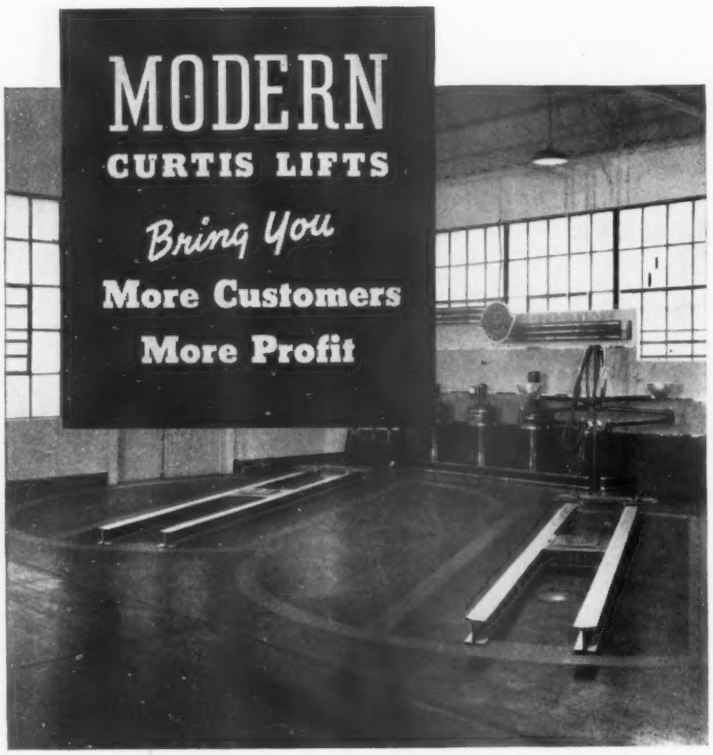
Let Penola Expee be your "in" to rich, new business . . . help you land new customers for your entire line. Get complete details from Penola. Write today!

PENOLA EXPEE COMPOUND

Sold under its own or private label

PENOLA INC., 30 ROCKEFELLER PLAZA, NEW YORK CITY

Formerly Pennsylvania Lubricating Co.



Customers go where equipment is modern. They know they can get better, quicker service where the management and facilities are up to the minute. And they like to watch their car up on a Curtis Lift where they can see what is being done.

Give your customers what they want—more efficient service on a modern Curtis Lift. It will mean more customers and *more profit.*

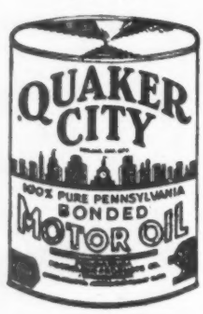
These proved distinctive features enable you to do better, faster work with Curtis Lifts:

- COMPLETE ACCESSIBILITY—every lubrication point easily reached
- HANDLES ALL CARS—any make, any model
- SELF-LEVELING PLATFORM—won't stick coming down
- DROP-AWAY WHEEL GUIDES—automatically center car
- ABSOLUTE SAFETY—oil-locked, 4-ton capacity

CURTIS PNEUMATIC MACHINERY CO.
1965 Kienlen Avenue, St. Louis, Missouri

DISTRIBUTORS WANTED — QUAKER CITY OIL

Since 1919



Low Prices . . Exceptional Quality

QUAKER CITY 100% Penna. oil sales increased 300 per cent in 1937 (there's a reason). The popularity of this brand is growing by leaps and bounds. Prices are low . . . quality is high. Exclusive territory available. Shipped in one quart cans and drums.

Inquire at once

PENNSYLVANIA PETROLEUM PRODUCTS CO.
1625-27 So. Water St., *Dept. J.* Philadelphia, Pa.
QUAKER CITY OIL IS SOLD FROM COAST TO COAST

Permit No. 706

gasoline sold by the seven companies. This compares with 82.73 per cent in 1936 and 80.88 per cent in 1935.

Sales of premium grades of gasoline still were on the upgrade but were far from being substantial. Premium sales of the seven companies represented 2.98 per cent of all gasoline sold in 1937 compared with 2.73 per cent in 1936 and 2.31 per cent in 1935.

Looking at the change in premium motor fuel sales from another angle the picture appears more rosy.

The seven companies sold 19,262,000 gallons of premium gasoline in 1935; 25,945,000 gallons in 1936 and 29,153,000 gallons in 1937. The 1936 increase over 1935 was 34.7 per cent. The 1937 increase over 1936 was 12.8 per cent.

Both premium and regular grades of gasoline cut into the gallonage of third grade gasoline as they have since 1934 when that grade reached its sales peak. In the three years since 1934 the sale of third grade gasoline by the seven companies has fallen 33,130,000 gallons. In the same period the sale of regular grade gasoline has risen 241,848,000 gallons and the sale of premium gasoline has risen 12,163,000 gallons.

Following are the actual gallonage figures for the seven companies by grades for the past five years.

Regular Grade

1937	812,071,000
1936	785,704,000
1935	674,978,000
1934	570,223,000
1933	506,776,000

Third Grade

1937	137,966,000
1936	138,106,000
1935	140,283,000
1934	171,097,000
1933	154,195,000

Premium

1937	29,153,000
1936	25,945,000
1935	19,262,000
1934	16,990,000
1933	32,268,000

High Schools Contest For "Lube" Champion

CHICAGO, April 30.—The Chicago division of Socony-Vacuum Oil Co. concluded its high school lubrication contest last week when the winners from 15 city high schools competed for the city high school lubrication championship.

Socony-Vacuum had supplied all Chicago high schools, in co-operation with the school board, with books of instruction and lubrication charts. The contestants were admitted also to the Socony's lubrication clinic.

The 15 high school champions competed for the city championship at the company's service station at 4844 Broadway. Socony technical men were judges. The winner was awarded a job with Socony-Vacuum, on graduation in June. Similar contests are held annually throughout Illinois high schools.

Modern Farm Kitchens Offer Kerosine Market

CLEVELAND

WHILE PUBLICITY on rural electrification projects has given the impression there is a constantly decreasing market for kerosine in farm homes, many a jobber serving farm areas knows that his kerosine sales are actually increasing.

In fact, total consumption of kerosine in the U. S. in recent years has been consistently gaining as is shown in the following figures:

Year	Bbls. 42 Gals.
1929	36,032,000
1933	38,493,000
1936	51,428,000
1937	54,951,000

Without doubt this remarkable increase in recent years is to be largely accounted for by the demand for kerosine as a tractor fuel, but as a matter of fact an indeterminate percentage of the increase—in many areas—is the result of farm kitchen modernization with kerosine-burning appliances, a fact attested to by the sale of some $20,000,000 of kerosine stoves, water heaters and refrigerators in 1937.*

Whether or not a jobber or any other oil marketer is missing some relatively high-gallonage kerosine accounts can only be determined by a survey of his particular marketing territory. This has been done by the tank truck drivers themselves in many cases who visit the farm kitchens on their routes, or ask questions of the trade when delivering into the drums in the barn.

While rural electrification has superseded kerosine for many uses in some localities, not one farm in five yet has such electrification in the U. S. as a whole and even after eight years from now, according to government estimates, there will still be 4,000,000 out of 6,813,000 farm homes without electricity. Electrification at the end of the first six months of 1937 had been extended to 1,138,335 farm homes, which is about 17 per cent of such homes. Those figures, however, include all installations over a period of years, prior to June 30, 1937. The number of installations made during the first six months of 1937 was 119,342. If that rate were to be maintained during the second half of 1937, the total for the year would be 238,684, or considerably less than 4 per cent of the total number of farm homes.

The modern farm kitchen now includes a kerosine range and a kerosine refrigerator. A kerosine hot water heater adds to its completeness

There must be three or more farms per mile before the government will make loans for electrification.

What about, then, the 5,435,331 rural dwellers who now are "waiting" for electricity, and the 4,000,000 who still will be waiting in 1946?

These "forgotten families" may not be able to get electricity, but they read the advertisements deploring "washboard, woodpile and pump slavery" just the same. Because of this, an official of the Perfection Stove Co., Cleveland, manufacturers of oil burning devices, pointed out, the farm wives are becoming more and more interested in modernized equipment. Since they can not have electricity, the answer for them is kerosine-burning equipment. There is not a major electrical device for the kitchen that does not have its stream-lined kerosine equivalent; cooking stove, hot water heater, automatic refrigerator and even a warm air conditioner.

In addition to considering the low rate of electrification (4 per cent of the farm homes per year), a picture of the present and potential kerosine market in home kitchens can be obtained from an examination of the number of kerosine-burning devices in use.

This data is summarized in Table 1, which was prepared by the engineering department of the Perfection Stove Co. from their knowledge of sales of kerosine devices over the country and their average consumption of kerosine. This

*Sales of $20,000,000 represents an estimate based on Bureau of Mines figures. Actual 1935 figures was $25,000,000, which included, however, $6,600,000 of pot type heater usually burning fuel oil. This did not include refrigerators, however.

The modern farm laundry operates on a petroleum fuel as well as the kitchen. A motor using gasoline for fuel gives the farm housewife a running water system, operates the washing machine and a kerosine water heater is still another convenience

table indicates that, in 1933, half the total kerosine consumption of the country was in cooking stoves, portable heating units and hot water heaters, as used both on farms and in small towns, summer resorts and so on. Figures for later years are not available and this ratio of consumption may be changing now because of the growing use of the small kerosine tractors on farms.

The annual volume of kerosine cooking stove sales amounts to $10,855,747 (1935 Department of Commerce figures) and in the same year 64,486 kerosine water heaters worth $736,958 were sold. The sale of these heaters is said to be increasing rapidly. Compared with the 1935 figures, sales in 1931 were 12,086 heaters totaling $226,089, and in 1929 sales of 26,582 were made with a total value of $447,903.

These figures include sales in small towns as well as to farm homes. In 1930 (year of the U. S. Census) there were 5,927,000 homes in towns of 2500 population to 200 population. This compares with 6,600,000 farm homes in the same year. The importance of towns from 200 to 2500 as kerosine markets is indicated by the fact that one large manufacturer of kerosine-burning devices said that his dollar volume of town sales to farm sales was as 2.88 is to 1.47, or approximately twice as large. The number of kerosine burning devices in a given community depends to a great extent upon whether or not it has natural gas, since kerosine does not usually compete with natural gas. Nevertheless, sales of kerosine devices are well distributed over the entire country, except for a certain group of western and southern states, according to sales figures representative of the companies manufacturing the kerosine burning equipment.

Since there are 48 states in the union, the average sales per state would be slightly over 2 per cent. States which are the best markets bought considerably more than this average. Conversely, of course, poor market states took much less. States buying from 4.5 to 8.4 per cent each of household oil burning devices were as follows: Texas, Illinois, Pennsylvania, Missouri, North Carolina, New York, Kansas.

States buying from 2.5 to 4.5 per cent each were: Minnesota, Iowa, Indiana, Ohio, Oklahoma, Wisconsin, Michigan, South Carolina, Virginia.

States buying from 1.65 to 2.5 per cent of all devices sold were: California, Kentucky, Florida, New Jersey, Nebraska, Georgia, Maryland, Massachusetts.

The remaining states, notably in the far west and parts of the south, were light markets.

The three principal kerosine burning items that comprise the modern, streamlined kitchen for the housewife are a cabinet range, hot water heater and refrigerator which can be purchased for a total of $475 as a maximum, and much less if smaller units can be used. Gasoline powered washing machines are also available.

A five-burner oil range, with an oven and porcelain enamel retails for about $125 plus freight. The cooking range is designed to harmonize in the modern kitchen with the oil burning refrigerator. The ranges have a hinged-front panel to conceal the burners, and embody many technical improvements making possible clean, fast heat, instantly adjustable for the exact degree of heat needed.

Cooking stoves are, of course, by far the most important kerosine-consuming equipment in the home. Many electrified homes use kerosine for cooking, since the fuel costs are low. A table of amounts of heat obtained for one cent compiled by fuel engineers shows that 2893 b.t.u.'s are obtainable for one cent with kerosine, even at a higher-than-average price of 14 cents per gallon, while only 1025 b.t.u.'s of electric heat are obtainable for one cent, if the price (lower than average) is two cents per kwh.

Perfection's sales of hot water heaters have increased rapidly as more and more farms are installing power or running water systems in the homes. Water heaters are made, however, usable with a hand force pump at the kitchen sink. They are manufactured with one or two short drums and vary in retail price from about $24 plus freight to $70. Fuel oil water heaters, where a large volume of hot water is required, vary from about $70 to $85 plus freight at retail.

The refrigerators represent the last word in modern conveniences for the farm housewife. The large, 3-burner model sells for $272 and can be operated for an average cost of $10 per year. The burners are operated only about two hours a day, going out automatically after creating sufficient refrigeration to last 24 hours. Burners

TABLE I

Number of Kerosine Devices in Use in 1933 and Consumption of Kerosine

(Compiled by Perfection Stove Co., Cleveland)

	Cooking Stoves	Portable Heating Stoves	Water Heaters
	8,399,244	2,713,870	624,302
Gals. used in yr.	76.8	18.5	96.5
Total Gallonage	645,069,939	50,206,595	60,295,143
Barrels	15,350,617	1,195,395	1,434,408

Total barrels: 17,980,420 bbls. or 50.2% of the total kerosine used in 1933, 38,493,000 bbls.

Note: The number of kerosine refrigerators is comparatively small, estimated by manufacturers as only 150,000 at end of 1937.

This Appleton, Minnesota, jobber is doing a big-time selling job in a small town. The neat and compact service station pictured above is pumping a gallonage that will surprise you—and pumping it at a profit

ONE SERVICE STATION TO EVERY 100 INHABITANTS

but Minnesota jobber builds profitable business in three years

THE TOWN of Appleton, Minnesota, boasts a population of about 1,700 and has 17 filling stations; yet last year the station operated there by the Appleton Oil Company averaged 8,400 gallons of gasoline a month—or 5 gallons a month for every man, woman, and child in Appleton. Since the station first opened, they have sold over two tons of grease and lubricated over 1,300 cars.

That sounds like a profitable business—and it is! Three years ago T. H. Holtey, proprietor of the Appleton Oil Company, planned his new station with care. He was jobbing a product with good consumer acceptance but knew that it would take a lot of aggressive merchandising to put over a station in a territory with such low potential per station. He didn't skimp on cost or equipment and the first greasing hoist to be installed in Appleton was at the new Holtey station.

WHAT DID HE HAVE THAT YOU HAVEN'T GOT?

Here is a different sort of Phillips 66 success story. The Appleton Oil Company has been a jobber of Phillips 66 products for years, and naturally that was the brand sold at the new Appleton station. The sales record they have hung up in only three short years would make any supplier pop a vest button and we think a lot of the letter that Mr. Holtey sent us.

"We opened this new service station in the fall of 1934," writes Mr. Holtey, "selling Phillips 66 products exclusively. In 1934 we averaged 8,400 gallons of gasoline and 350 gallons of oil a month. We sell our customers Phillips 66 Motor Oil exclusively as we believe it is the finest oil that money can buy. To Milton Martins in charge of the grease rack, and to the high quality of Phillips 66 greases goes the credit for our excellent showing in the lubrication department.

"In 1934 we had the only hoist in town for greasing cars, but now there are three hoists besides our own. There are 16 competitive dealers, too, in this town of less than 1700 people."

SERVICE STATION PROFITS DEPEND ON REPEAT BUSINESS

Mr. Holtey is a business man as well as an oil jobber, and he is a mighty good merchandiser, too. He will agree with us that a forceful well planned advertising program is necessary to bring in customers, and the products sold have to "demonstrate" to keep the customers coming back for more. The ability of the Phillips 66 shield to attract and hold customers is strikingly demonstrated by the success of this station.

Are you having trouble holding your customers? Are you satisfied that you are getting your share of the business? Did you make a profit in 1937?

Maybe we have the answers. In any case it won't take much time to get the Phillips 66 story—and the franchise may be open in your territory. Just write, wire, or phone

PHILLIPS PETROLEUM COMPANY

Bartlesville, Oklahoma

Chicago	Minneapolis	St. Louis
Indianapolis	Des Moines	Omaha
Peoria	Kansas City	Wichita
Tulsa		Amarillo

The Accepted Standards of Pennsylvania Bright Stock Excellence Since 1900

H-M and L-M Oils Are Made Solely By

THE CONEWANGO REFINING CO.

Warren, Pa.

are available also for the use of bottled gas, as well as kerosine. The refrigerator provides the farm housewife with ice cubes, and has a large cabinet to accommodate the large amounts of produce, eggs and meat on hand.

Portable kerosine heaters, hardly necessary in the kitchen, are nevertheless used to heat up many a bedroom or bath on a frosty morning. The average heater burns 18.5 gallons of kerosine a year, according to Perfection Stove officials. These also, have been greatly improved to add to the economy of consuming fuel only when heat is needed. For beauty, the portable heaters are equipped with "firelight" glass globes and finished in two-tone porcelain enamel.

No story on the modernized rural home would be complete without mention of warm air conditioner plants, although they burn fuel oil rather than kerosine. The warm air conditioning plants operate automatically, serving clean, correctly humidified air at any specified temperature, regardless of wintry weather outside. These plants, costing from approximately $185 and up, are naturally a luxury on farm homes, but the fact that Perfection has found it profitable to manufacture them indicates the consciousness of comfort on the part of the small town and rural dweller, his wife and household. Perhaps it would be safe to say that there is more of a growing kerosine market from farm homes that will discard coal and wood stoves and will install power water systems and will purchase refrigerators than is lost to electrification.

Profits in Accessories Are Shown By Chart

A unique new chart, known as the "Fortune Teller", has been issued by Shell Petroleum Corp., St. Louis, to give its dealers exact figures on the profits they can make on "full line" selling.

In its message introducing this device, Shell states; "Just as you set up a margin on gasoline of approximately 3½ cents, so you can add at least another 4 cents per gallon by selling the other items your customer needs".

The chart is made of two circular pieces of brightly lithographed cardboard, fastened to either side of a 14-inch square cardboard. By setting the circles so that the average monthly gallonage of a dealer's station shows through the proper little windows from the square beneath, the dealer can quickly estimate his profits by referring to other tables on the chart.

One column of figures shows how a station's profits increase sharply as its motor oil ratio is improved. Another column gives the total gross profits a dealer will realize if he does a 100 per cent, 75 per cent, or 50 per cent selling job. A third table then sets up monthly quotas for his various products and services, also based on his gallonage,

The "Fortune Teller," a new chart put out by the Shell Petroleum Corp., St. Louis, to show their dealers the additional profits in selling a "full line" of accessories and services at their stations

and a fourth table breaks those figures down into daily quotas.

"To do a 'full line' selling job," the chart reads, "make these sales with every 1000 gallons of gasoline: 30 gallons of motor oil, 5 gallons of other lubricants, 10 Shellubrication jobs, $20.25 in tires and tubes, $21.50 in accessories, and specialties, and $3 in paid services." On that standard, all figures on the chart are based.

"We believe," says R. T. Seidel, retail merchandising manager of the Shell company, "that we have developed a tool which will prove invaluable in getting the dealer to understand what we have been preaching for so many years —that is, the profit possibilities in selling his full line, and the cumulative importance of profit margins when the full line is sold."

Keep Tinsel from Overhead

(*Continued from page* 36)

port drums or half drums with the tank mounted, oil in two and five-gallon cans and package grease can be carried on the body at the head end of the tank or in the cab.

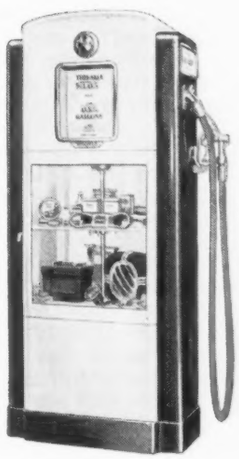
The tank is mounted on two 3 x 4 inch timbers, both resting on the bed of the stake body. The tank is attached to the timbers with three-inch U-shaped angle irons, three on each side. A bolt extends from each side of the bucket compartment, through the side of the stake body, and with the wing nuts holds the tanks on the truck.

At the head of the tank, on the stake body bed are two wooden bumpers, extending the width of the bed. One is a 6 x 6-inch timber, the other 4 x 4-inch. In case of a sudden stop the tank could not move forward and jam into the driver's cab as the ends of the timbers supporting the tank are against the wooden bumpers.

New Equipment

AND THE MANUFACTURERS

NEW DISPENSING PUMP.—A new merchandising display pump, with a roomy cabinet in the body, has been announced by the Wayne Pump Co., Fort Wayne, Ind. Known as model 71, it provides more than five square feet of display area in the glass shelf and bottom of the case and is large enough to display bulky items such as radios, heaters, and batteries. Service doors,



provided on each side of the case, may be locked at night. The mechanism, which is housed in the base and occupies less than 1¾ cubic feet of floor space, can be reached through hinged panels above and below the show case door on both sides of the pump. According to the company announcement, the new model 71 has been designed to harmonize with the Wayne model 70 pump.

* * *

LARGEST TIRE — Construction of what is said to be the industry's largest heavy-duty truck tire (size 24.00-32 weighing 1200 pounds) has been completed by Goodyear Tire and Rubber Co., Akron, O. It is a 30-ply tire, which, when inflated at 75 pounds air pressure, will have a load capacity of 25,000 pounds. Outside diameter is 82 inches. As compared with the 120 x 33.50-66 marsh-buggy tires built last year for oil-geology surveys, the new tires outclass these in weight by 885 pounds and in inflation pressure.

* * *

The Meyercord Co., manufacturer of Decalcomania transfers, is moving its general office May 1 from 208 W. Washington St., to 5323 W. Lake St., Chicago. The general office will be in a new building opposite the factory.

SPARK PLUG RACK—A compact rack containing an assortment of spark plugs and a chart of plug specifications for each automobile for the last seven years, has been made available to dealers by Champion Spark Plug Co., Toledo, Ohio. The rack is built for either counter or wall display. It measures fractionally less than 12 x 5 x 15 inches and weighs 13½ pounds loaded.

* * *

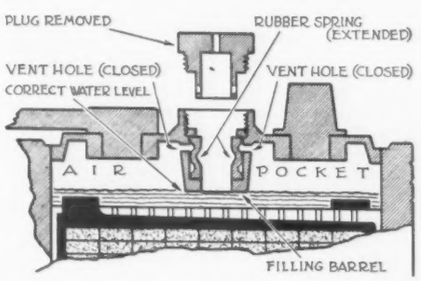
SOCKET INSTRUMENTS—A 20-page booket entitled Socket Instruments, illustrating installations, applications and economies of these plug-in instruments is announced by Westinghouse Electric & Manufacturing Co. Copies may be secured from district offices or from the company headquarters at East Pittsburgh.

* * *

MOTORS—Wagner Electric Corp., St. Louis, announces the addition of high-torque, double-capacity motors to their line of single phase motors. These new motors are designed as type RZN when equipped with rigid mountings and type RZNR when equipped with annular resilient mountings. They are available in 110-220 volts, in sizes one-third, one-half, three-quarters and one horsepower ratings.

* * *

BATTERY—Designed particularly to prevent overfilling of batteries for underhood installations and thus to eliminate the possibility of acid spray on engine parts, a new Type XS-192E Hycap Exide equipped with "No-Over-Flo" is announced by The Electric Storage Battery Co., Philadelphia. The new



battery is for Buick, Oldsmobile and Pontiac cars.

The new device consists of a short rubber bellows tube in the filling barrel. When the plug is removed, the bellows tube extends and closes vent holes in the barrel so that when the water reaches the bottom of the filling barrel it rises only in the barrel. The plug, screwed back into position, compresses the bellows and opens the vent holes.

DRESS UP WITH COLOR

If you want your gasoline to "go places", dress it up with one of the nineteen well-known, snappy

DYKEM
Self-Mixing
GASOLINE COLORS

They create a sales appeal which means repeat sales. Even if customers forget your brand name, you can still make them remember the quality of your gasoline because of its distinctive, sparkling shade, if you use

DYKEM GASOLINE COLORS

GREEN BN (deep sea shade)	BROWN YR (walnut brown shade)
GREEN N (bluish grass shade)	MAHOGANY WRF (deep mahogany shade)
GREEN YN (medium emerald shade)	ORANGE Y (reddish orange shade)
GREEN GN (bright emerald shade)	ORANGE GY (yellowish orange shade)
BLUE (deep sky shade)	ORANGE GR (deep orange shade)
RED (scarlet shade)	BRONZE ORANGE R (bronze orange shade)
RED B (bluish rose shade)	AMBER Y (amber shade)
VIOLET (deep violet shade)	BRILLIANT YELLOW (sunset golden shade)
PURPLE R (bright purple shade)	YELLOW N (lemon shade)

BLACK B (deep black shade)

Prompt shipments in any quantity.

DYESTUFFS & CHEMICALS, INC.
11th & Monroe Sts
St. Louis, Mo.

In Canada: The Dykem Co., of Canada, Ltd.
3194 Dundas St., W., Toronto, Ont.

DYESTUFFS & CHEMICALS, INC.
11th & Monroe Sts., St. Louis, Mo.

☐ Send us full information about DYKEM Gasoline Colors.

☐ Send sample of DYKEM ..... (Color)

..... Name

..... Address

..... City State

Automotive NOTES AND COMMENTS

By John W. Thompson
N. P. N. Staff Writer

THE automatic transmission, like the blue plate luncheon and the good five-cent cigar, is a slightly over-exaggerated term. As you probably know, the blue plate luncheon often turns out to be a green plate or a yellow plate, and the good five-cent cigar is something this country still needs.

His honor, Adolf P. Publique, has heard a lot in the past few months about automatic transmissions, and in his mind every car that has no shift lever located on the floor is equipped with one of these "affairs".

As a matter of fact, some knowing engineers predict that there is little possibility of a fully automatic transmission being available in the near future.

Warner Gear's chief engineer, S. O. White, speaking before the SAE passenger car group in Detroit a few weeks ago, remarked that it is almost impossible to make a mechanism that will carry out all or part of the functions of selecting or changing gears without such a device insisting occasionally on doing things a little differently than the driver would like to do them. Thus obvious advantages might easily be discounted because of some relative minor disadvantages.

White points out, too, that too much has been done toward "building a pair of crutches for the engine" and doing nothing about the engine itself. He states that any recent proposals to cut engine weight have been met with "a banker's stare" because of the slight additional expense involved, but that a "complicated piece of machinery behind the engine to help offset its lameness" it is treated with much flag waving and widely advertised as a revolutionary development.

In each case, says White, such mechanisms increase the car weight, and have added from $35 to $100 to the cost, with the "advantages mainly theoretical and certainly highly debatable". By applying known facts to the design of the car and a small part of that extra cost to the engine, he believes it would easily be possible to have a car with less gear ratios and less shifting.

White recommends a lighter vehicle with increased engine ability, and includes the following features which have already been tried experimentally with success: (1) the simplest type of centrifugal clutch; (2) a two-speed forward and one reverse gear box; (3) an overdrive unit, preferably automatic in its engagement and disengagement.

* * *

You have heard of the Tobacco Road, the Road Back Home, the Road to Mandalay, and the rhododendrons; but have you heard of the molasses road? Ah, no, probably not.

Then come with us to that far off land of mystery, of intrigue, and of so many other things too numerous to mention . . . India. It is here that we head our car toward Calcutta, that far off city of mystery, of intrigue. Going straight to the office of the American Trade Commissioner, we are greeted and refreshed after our ride by a round of poomba (baambi-baambi to you).

And as we sit in the commissioner's gadoona, we are told of a strange new development conducted by that organization of mystery and intrigue, the Imperial Institute of Sugar Technology of India. As the sun now begins its downward journey of the day, the commissioner unfolds the institute's (not to be confused with the API) story of how a means has been found of converting molasses into an insoluble resinous product suitable for use as road surfacing material.

From where we sit on the commissioner's gadoona, we can clearly see his umpado as he tells us that this process involves the resinification of molasses with a mixture of coal tar and asphalt in the presence of acids. We learn further that it is claimed that the cost of manufacture per ton of this material is about one-third the cost of a ton of asphalt.

The sun has now dipped its fiery head into the hills that lie beyond Calcutta, and as we take our leave we turn and wave our boombo at the commissioner. It is dusk now, and the city of mystery and intrigue fades from view.

Junior dear, will you please stop kicking that man's seat in front of you!

* * *

General Motors' tax bill for 1937, based on the average number of employes on the payroll in the U. S. during the year, was equivalent to $444 per employe. Its total tax bill for the year amounted to $104,959,000, or approximately $13,800,000 more than in 1936.

To give you an idea of the magnitude of this bill, if all the payments were in one dollar bills and laid end to end, they would reach thirty times across the continent, with enough left over for side trips to Lake Placid and Churubusco, and a box of chocolates for Cousin Prunella.

* * *

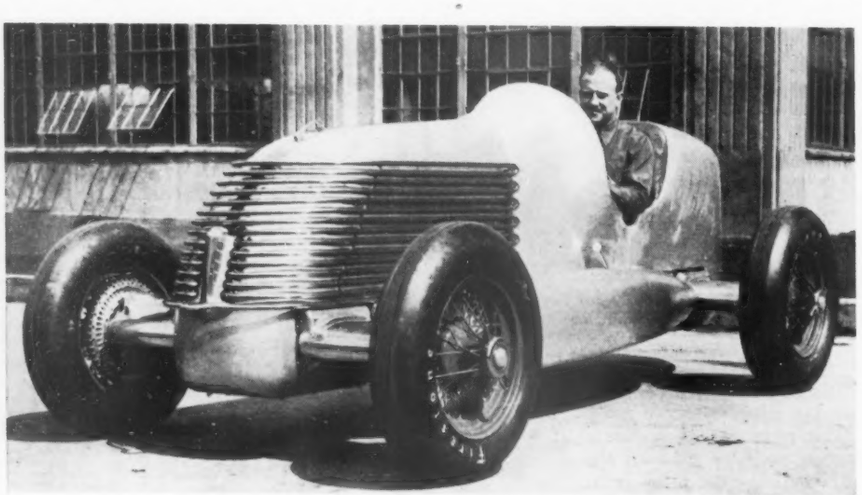
Not all of the aspirin tablets are sold to oil men.

Some of the better and more distinguished types of headaches created in automotive minds result from over-indulgence in thinking about car servicing. C. E. Bleicher, vice president of De Soto, discussed the cause of one such headache when he addressed the SAE at Detroit late in March.

He says that as the manufacturer gets more and more cars of different models on the highway, the service problem becomes harder to handle, for where the life of a car used to be about 5 years, it is now about 10 years.

"Let us take for example," says Bleicher, "that we were building 200,000 cars a year, and that the average life of a car was 9 years. We would have 1,800,000 cars in the field of 9 different models. Were we to carry $2 worth of parts per car in the field, and sales are considerably in excess of this, we would have an inventory of approximately $3,600,000. As you are only able to store about $8 worth of this material per square foot of floor space, you can see why service is becoming more and more a problem."

We are reminded of an old saying



This is one of five racers that the veteran race driver, Harry Miller, is readying for the Memorial Day race at Indianapolis. Note the tubular radiator pipes that weave around the nose of the car, and the sausage-shaped gasoline tanks mounted in the same position as the running board of a conventional car. The car's four-cylinder engine turns up 235 horsepower at 4500 r.p.m., and is on a chassis with a 95-inch wheelbase. Meet Billy Winn, veteran racing driver, at the wheel

that "big baseball bats from little hickory nuts grow". What are you reminded of? Send in your entries to our Reminds-Me-Of editor before the boss reminds him of something.

* * *

A few weeks ago this department leaned way out the window to remark that General Motors' entry into the diesel field on a production basis with large and small models might (we always say "might") be the means or the forerunner of bringing the passenger car and the diesel engine a step closer to partnership.

But now, D. P. Barnard, chief of the engine laboratory of the Indiana Standard (an oil company), in a prepared statement to the press, pushes us out of the window and onto the hard sidewalk by remarking that the small diesel is not comparable to an average or even a large gasoline automobile engine. The diesel's use on the highway, continues Dr. Barnard, is most logical under conditions of continuous operation and substantially constant scheduled speeds, and obviously does not fit the requirements for the great bulk of passenger traffic.

The Doctor then picks us up, carries us to the window again, and repeats the operation of pushing us out, by stating that "present fuel injection systems for diesels of small size cost about as much as a complete gasoline engine of the same capacity, and to date a cheaper and more successful type of fuel injection system is not available". For this and similar reasons he argues that a small diesel engine costs inevitably two or three times as much as a comparable gasoline engine, and they are at least 10 years behind the gasoline engine in development.

Not wishing to take advantage of its position, this department will simply say, "Ah, Dr. Barnard, aren't you the one, though".

* * *

Are you interested in automobile steering gears? You are? Then you'll certainly want to know about some of the different establishments which take part in some phase of automobile steering gear production. Here are some, which show the extent to which the automobile industry depends upon other industries—

steel mills
tube mills
bearing makers
iron foundries
drop forging plants
die casting plants
zinc smelting plants
plating works
paint and enamel works
brass plants
screw machine parts factories
lubricant manufacturers
plastic manufacturers and molders
gear manufacturers

Are you surprised?

* * *

Now it is reliably reported that the American people have enough cavities in their teeth to keep the country's 60,000 dentists busy for the next 100 years. We mention this simply to assist the economists who chart our business futures. We base economic conditions on freight car loadings, gasoline sales, ingot production, stock transactions, and other such familiar methods. But this idea of determining the business condition of the nation by the number of decayed teeth is something which we are quite sure even the federal badministration has overlooked. Couldn't some Congressmen find a new revenue producer through a tooth cavity tax?

* * *

And now for our little trip into Tire Land, where we are told that 30 years ago the average motorist had an annual tire bill of $176, and that today he spends less than one-tenth of that amount for six or seven times the tire mileage. Tires as you may or may not know, are now being used on many types of vehicles, such as wheelbarrows, transport airplanes, and manure spreaders.

While we wont go as far as to say that the tire is here to stay, we can be safe in saying that the tire is here, can't we?

Oil Concern Sets World Safety Record in Truck Driving

CLEVELAND—A world record for safety in the operation of a commercial fleet of trucks belongs to the Central Texas Division of the Panhandle Refining Co., Wichita Falls, Texas, the company announced in connection with its annual statement to stockholders.

This company's drivers rolled up a perfect driving record for 2,294,741 miles, with no accidents, from April 4, 1936 to June 30, 1937. The company employes 228 drivers, has 152 vehicles, 60 wholesale plants in Texas, Oklahoma and New Mexico, and divides its marketing operations into these four divisions: Central and West Texas, Oklahoma and New Mexico. Roy B. Jones is president.

When the Panhandle company dropped its membership in the National Safety Council in 1933 and 1934, accidents were so numerous that in 1935 it again joined the council and set up a complete safety program, the company stated.

A comparison of the company's fleet accident records in 1936 against 1934 shows a reduction of 71 per cent in 1936 from 1934; or two accidents in 1936, against seven in 1934.

In the 1936-1937 National Fleet Safety Contest, the Panhandle company placed winners in the three of the 23 divisions, the Central Texas Division winning first place in Group 3 of the passenger car group; this division again, first among the large fleets in the petroleum group; and the Oklahoma Division first among the small fleets in the same group. The New Mexico division received honorable mention in the latter group. None of the four divisions had an accident during the year of competition.

All Panhandle trucks in the petroleum group had an accident rate for the contest of 0.40 per cent per 100,000 miles of operation, while all the petroleum fleets in the competition had a rate of 2.72. These Panhandle trucks covered 6,172,296 miles of highway with only two accidents.

Such safety records are obtained only by constant effort and keeping safety foremost in the minds of the drivers, President Jones stated. His ultimatum is that a careless man is not wanted on the payroll, that any employe who is constantly having accidents, whether slight or serious, must either improve, or leave the company in a manner that he will not continue to spoil the entire company's safety record.

The company has organized the Panhandle Safe Drivers' Club whose members come from all of the six company departments—refining, marketing, producing, development, transportation, and Panhandle Steel Products Co.

Meetings are held monthly at which time accidents, hazards, new road conditions and laws, speed and other safety items are discussed. Men are selected in the 21-to-35 year age bracket, married, sober, law-abiding, safety-minded, mechanically trained, and able to pass a medical examination. Each driver is checked daily and the practice of following him in another car without his knowledge to check his regard for others, his observance of traffic rules, etc. has proven successful, the company states.

---

7 Have 35 Year Record

LOS ANGELES, May 2. — Four officers and employes of the Tidewater Associated Oil Co. reached 35-year service records this year and were honored recently by President William F. Humphrey, president.

He also pointed with pride to the fact that 2067, or 47 per cent of the personnel of the Associated Division had service records of 10 years or more.

The four officers are J. A. Jones, assistant vice president; G. D. Zeh, manager of the marine department; W. S. Badger, tax department, and Carl Bronson, sales agent at San Jose. Three others reached the 35 year mark last year, making the total number of seven with the company 35 years or more.

Diesel's Role in Transportation Discussed by Engineer

N. P. N. News Bureau

CHICAGO—Although a popular impression prevails that the day of general use of the diesel automobile engine is near, an oil company engineer recently stated the gasoline engine was far from being an outmoded form of power, to be pensioned and put to pasture along with the horse.

The diesel has its most logical place on the highway under conditions of continuous use and substantially constant speed, said Dr. D. P. Barnard, chief of the engine laboratory of the Standard Oil Co. of Indiana. These conditions, he continued, obviously do not fit the uses of the great bulk of passenger automobile traffic.

For the marketer concerned with possibilities of diesel fuel replacing gasoline in part, the statement holds that the new small diesel engine, which has received much publicity lately, will probably add to the total consumption of petroleum fuels, rather than take from the gasoline market.

The new small diesel, Dr. Barnard stated, "is being developed to fill a place for which there is at present no other engine so logical."

Diesel fuel consumption in 1936, he stated, was 4 per cent of total petroleum consumption. And of this 4 per cent, 3.6 per cent was heavy diesel fuel, and less than .5 per cent was fuel for the new small diesel, he said.

Following is Dr. Barnard's statement:

Cost Is High

"Present fuel injection systems for diesels of small size cost about as much as a complete gasoline engine of the same capacity. And to date a cheaper and more successful type of fuel injection system is not available. For this and similar reasons a small diesel engine costs inevitably two to three times as much as a comparable gasoline engine.

"The diesel's most logical place on the highway is under conditions of continuous use and substantially constant scheduled speeds. Obviously, it does not fit the requirements for the great bulk of passenger traffic.

"It should be noted that the small diesel, which has received considerable publicity recently, is not comparable to an average or even a large gasoline automobile engine. It is being developed to fill a place for which there is at present no other engine so logical. Although there is every indication that such engines will eventually be used in large numbers in commercial vehicles their net effect will probably be to increase the total demand for petroleum fuels rather than to shift demand from gasoline to heavy fuel.

"These small, comparatively high-output diesels are in a very embryonic state as far as their performance is concerned. Much experimenting will be necessary before the exactly proper method of fueling them will be known. This engine is much more finicky about its diet for anything approaching the same degree of flexibility than the spark-ignition engine ever dreamed of being. Therefore, if the demand for such engines for special purposes should become acute, the fuel problem also would become serious. In any event it is likely to be more of a problem than has been encountered in fueling gasoline engines.

"The large and heavy diesels are less finicky and will burn heavy black oils. These heavy engines still constitute the great bulk of diesel plants in operation."

Referring to aircraft Dr. Barnard said that here the diesel engine was far from supplanting the gasoline, spark-ignition engine. While they have been tried experimentally, their disadvantages in the way of liability to mechanical failure, comparative heaviness and vibration outweigh their advantages, he said. Diesels here are at least 10 years behind the gasoline engine in development, Dr. Barnard said.

Petreco Official Dies

LOS ANGELES—D. C. Norcross, for many years president and general manager of Petroleum Rectifying Co., died recently at his home in Bel Air, Calif., after an extended illness. He was one of the organizers of the company in 1911 and served until late in 1937 when he retired with the title of honorary president.

Five Majors in Top 50 Newspaper Advertisers

FIVE MAJOR OIL companies were among the top 50 newspaper advertisers in 1937. These same five were among the top 50 in 1936 and 1935 also.

They are Socony-Vacuum Oil Co., Inc., 24th; Shell Oil, 28th; Sun Oil Co., 31st; Standard Oil Co. (Indiana), 33rd, and Tide Water Associated Oil Co., 46th.

Standard Oil Co. (California), Gulf Refining Co. and Standard Oil Co. of New Jersey were 58th, 59th and 60th in rank respectively.

These figures of the largest national newspaper advertisers, prepared by Editor and Publisher, cover the linage used in 396 daily and Sunday newspapers of the 103 cities in the Media Records Blue Book list. Many advertisers used long lists of newspapers outside these larger cities, and such linage cannot be accounted for. Nor do the lists necessarily accurately reflect expenditures in newspapers, since some advertisers use the largest, high-rate newspapers, while others pick newspapers with smaller circulations and lower rates.

The 23 subsidiaries of General Motors Corp. placed that organization first among newspaper advertisers with 22¼ million lines. R. J. Reynolds Tobacco Co., (Camels, etc.), was second with nearly 15½ million lines in three accounts; but Liggett & Myers, concentrating its whole 14,822,000 lines on Chesterfields, easily had the largest single account.

Cigarets, automobiles, liquor and soaps monopolized the first twelve places.

Socony-Vacuum bought 2,537,379 lines for four of its subsidiaries. Four-fifths of this linage was for Socony-Vacuum Oil Co. products, the rest for Socony fuel oil, General Petroleum Corp. products and Magnolia Petroleum Co.

Socony-Vacuum, Shell, Sun and Tide Water dropped their 1937 advertising to between 82 and 87 per cent of their 1936 linage, and consequently dropped down somewhat from their 1936 rankings. Standard of Indiana ran 103 per cent of its 1936 linage. The principal oil company advertisers in the 103 large cities and linage are as follows:

Linage in Thousand Lines

Company	1937	1936
Socony-Vacuum	2537	2905
Shell Oil	2260	2588
Sun Oil Co.	2198	2636
S. O. Indiana	2000	1945
Tide Water	1577	1921
S. O. Ohio	1409	968
Continental	1377	1360
S. O. California	1350	1426
Gulf	1325	2405
S. O. New Jersey	1215	1612
Richfield	971	1024
American Oil	863	1101
Phillips	740	684
Union Oil Co.	498	629
Atlantic	404	851
Texas Co.	338	588
Jenney Oil Co.	255	69
Mid-Continent Pet.	237	210
Sinclair	225	22
Cities Service	222	41
Skelly	213	141
Gilmore Oil	205	200
S. O. Louisiana	154	176

New Patents

Compiled by R. E. Burnham, patent and trade-mark attorney, 511 Eleventh Street, N. W., Washington, D. C., from whom copies may be obtained at the rate of 25c each. State number of patent and name of inventor when ordering.

February 8, 1938

REFINING

Hydrocarbon oil conversion—John B. Barnes, Chicago, Ill., assignor to Universal Oil Products Co. Filed Mar. 16, 1931. No. 2,107,269.

Treatment of hydrocarbon oil—Seymour W. Ferris, Aldan, Pa., assignor to Atlantic Refining Co. Filed Apr. 19, 1935. No. 2,107,291.

Apparatus for decolorizing or desulphurizing hydrocarbons—James W. Wadsworth, Tulsa, Okla. Filed Dec. 20, 1928. No. 2,107,354.

Process of refining petroleum—Bertrand W. Story and Vladimir A. Kalichevsky, Woodbury, N. J., assignors to Socony-Vacuum Co. Filed Nov. 24, 1934. No. 2,107,429.

Conversion of hydrocarbon oils—Kenneth Swartwood, Chicago, Ill., assignor to Universal Oil Products Co. Filed Oct. 26, 1933. No. 2,107,454.

Composition and method treatment of hydrocarbon emulsions—William E. Elliott, Youngstown, Ohio. Filed Sept. 12, 1934. No. 2,107,473.

Conversion of hydrocarbon oils—Jean D. Seguy, Chicago, Ill., assignor to Universal Oil Products Co. Filed May 10, 1933. No. 2,107,509.

Separation of wax from mineral oil by filtration—William P. Gee, Plainfield, N. J., assignor to Texas Co. Filed Mar. 31, 1934. No. 2,107,664.

Extraction process—Willem J. D. van Dijck, The Hague, Netherlands, assignor to Shell Development Co. Filed Mar. 18, 1935. No. 2,107,681.

Process and apparatus for refining mineral oils—Herbert R. Rowland and Eugene J. Smith, Kansas City, Mo., assignors to Corona Conversion Corp. Filed Dec. 10, 1928. Nos. 2,107,713 and 2,107,714.

Processes for dewaxing oil—Maner L. Wade, Long Beach, Calif., assignor to Union Oil Co. of Calif. Filed Sept. 22, 1934, Apr. 17, 1937, and Sept. 22, 1934. Nos. 2,107,770, 2,107,771, and 2,107,772.

Conversion of hydrocarbon oils—Lyman C. Huff, Chicago, Ill., assignor to Universal Oil Products Co. Filed Jan. 19, 1935. No. 2,107,793.

Process for separating mineral oil products—Hermann Suida and Hans Poll, Vienna, and Alfred Nowak, Modling, Austria. Filed Apr. 24, 1935. No. 2,107,807.

MISCELLANEOUS

Process of purifying alcohols by removing the only impurities—Francis M. Archibald, Elizabeth, N. J., assignor to Standard Alcohol Co. Filed Nov. 20, 1934, No. 2,107,265.

Ester-containing lubricants and process of making—Peter J. Gaylor and Luther B. Turner, Elizabeth, N. J., assignors to Standard Oil Development Co. Filed Sept. 20, 1933. No. 2,107,316.

Process for production of hydrated olefines—Franklin A. Bent, Berkeley, Calif., assignor to Shell Development Co. Filed Aug. 28, 1933. No. 2,107,515.

Process for concentrating organic acids—Theodore Evans, Oakland, and Karl R. Edlund, Berkeley, Calif., assignors to Shell Development Co. Filed Nov. 21, 1933. No. 2,107,527.

Vapor phase hydrolysis of halogenated hydrocarbons—Ralph B. Perkins and Andrew J. Dietzler, Midland, Mich., assignors to Dow Chemical Co. Filed Apr. 29, 1936. No. 2,107,710.

Manufacture of alcohols—Vladimir Ipatieff and Vasili Komarewsky, Chicago, Ill., assignors to Universal Oil Products Co. Filed Sept. 1, 1933. No. 2,107,794.

Recovery and conversion of the sulphur content of industrial gases—Ludwig Rosenstein, San Francisco, Calif., assignor to Shell Development Co. Filed July 21, 1934. No. 2,107,907.

Apparatus for liquid level and pressure control—Irvin E. Nutter and Fletcher E. Martin, Whittenburg, Tex., and Gerald W. McCullough, Bartlesville, Okla., assignors to Phillips Petroleum Co. Filed Jan. 29, 1934. No. 2,107,955.

Grease manufacture—Gus Kaufman Beacon, N. Y., assignor to Texas Co. Filed May 31, 1935. No. 2,108,016.

Interlocking mechanism for gasoline dispensers—Reuben E. Bechtold, Fort Wayne, Ind., assignor to Tokheim Oil Tank & Pump Co. Filed July 13, 1936. No. 2,108,028.

FREEDOM offers 4 "Big Name" Oils

Fort Pitt, Beaver-Penn, Four-State and Penn Trump Motor Oils stand right at the top among the aristocrats. As 100% Pure Pennsylvania Grade Oils, they have built fine reputations for scores of jobbers and they have turned in some excellent profits. Your territory may be open for exclusive sales rights. Write today for information.

REFINED FROM 100% PURE PENNSYLVANIA GRADE CRUDE

These oils are sealed at the refinery in attractively lithographed cans. They are also available in bulk or they can be packed in jobber's own private brand cans.

THE FREEDOM OIL WORKS COMPANY
FREEDOM, PENNSYLVANIA

Pacific Coast Bulk Plant & Warehouse - - - Los Angeles, Cal.

RUMEX OIL PRODUCTS LTD.

Telephone: National 0131
Telegrams:—"Rumexoil"

25 27, Bishopsgate,
LONDON, E. C. 2

Prices Lower In April-June Contracts For U. S. Tank Car Requirements

N. P. N. News Bureau

WASHINGTON — Federal government's tank car gasoline requirements for the current April-June quarter are being supplied by a variety of brokers, Independent refiners and major companies, an analysis of contracts awarded by the Treasury Procurement Division reveals.

Prices in these contracts, for which bids were opened in February, range upward from 3.875 cents f.o.b. Oklahoma for third grade, 4.75 cents f.o.b. Oklahoma for regular (minimum 68 octane), and 5.47 cents f.o.b. Shreveport, La., for premium (minimum 75 octane).

Prices were generally lower than those in the January-March contracts.

Prices, except those in contracts on an f.o.b. refinery basis, were not readily comparable without knowing freight rates to destination and the land-grant allowance available to governmental agencies on some routings.

Prices tabulated below are the guaranteed maximum or top prices to be paid by the government. Should the seller's posted tank car price on date of shipment be lower than this maximum, the government agency will be billed at the posted price.

The government asked for bids on f.o.b. refinery basis (in which case the government pays the freight to destination) and on a destination basis where the price includes freight to delivery point. In the tabulations below, the column, labeled "f.o.b. point and shipping point," indicates the price basis for the particular item.

For example, the item in Region 1 of 10,000 gallons of V-68 (regular) for the Quartermaster at Fort Monmouth, Oceanport, N. J., is on a basis of f.o.b. Bayonne, N. J., with the government paying the freight from that point. The 13,250 gallons of V-68 for the Quartermaster at Plattsburg (N. Y.) Barracks is on a destination basis; the shipper pays the freight to destination and for this reason the price basis of this item is indicated as f.o.b. Albany, N. Y.

Tank Car Gasoline Awards For April-June Quarter

REGION ONE

V-68 Grade

3-Month Gallonage	Govt. Agency	F.O.B. Point and Shipping Point	Max. Price	Contractor
80,000	Holabird Quartermaster Depot, Baltimore, Md.	Destination, Shipped from Baltimore, Md.	6.54	Standard of N. J.
11,000	Quartermaster Corps, Edgewood Arsenal, Edgewood, Md.	Destination, Shipped from Baltimore, Md.	6.95	Standard of N. J.
50,000	Quartermaster Ft. Hoyle, Edgewood, Md.	Destination, Shipped from Baltimore, Md.	6.95	Standard of N. J.
49,000	Quartermaster Ft. George G. Meade, Md.	Destination, Shipped from Baltimore, Md.	6.81	Standard of N. J.
10,000	Nat'l Guard Bureau, Natick, Mass.	Motor Tank Truck Delivery from E. Braintree, Mass.	7.13	Cities Service
86,000	Quartermaster, 3rd CCC District, Ayer, Mass.	Destination, Shipped from Everett, Mass.	7.13	Colonial Beacon
10,000	Quartermaster Corps Area Motor Repair Shop, Boston, Mass.	Destination, Shipped from Everett, Mass.	6.87	Colonial Beacon
48,000	Naval Air Station, Lakehurst, N. J.	Destination, Shipped from Bayonne, N. J.	6.98	Standard of N. J.
29,750	Quartermaster, Camp Dix, Wrightstown, N. J.	Motor Tank Truck Delivery	7.1	Cities Service Asphalt Prods. Co. New York City
10,000	Quartermaster, Ft. Monmouth, Oceanport, N. J.	Bayonne, N. J.	6.42	Standard of N. J.
19,450	Quartermaster, Ft. Ontario, Oswego, N. Y.	Destination, Shipped from Syracuse, N. Y.	7.49	Colonial Beacon
47,475	Quartermaster, West Point, N. Y.	Destination, Shipped from Newburgh, N. Y.	6.92	Colonial Beacon
54,750	Quartermaster, Mitchell Field, Hempstead, N. Y.	Motor Tank Truck Delivery	6.9	Cities Service Asphalt Prods. Co.
18,000	Quartermaster, N. Y. Port of Embarkation, Brooklyn	Motor Tank Truck Delivery	6.9	Cities Service Asphalt Prods. Co.
13,250	Quartermaster, Plattsburg Barracks, Plattsburg, N. Y.	Destination, Shipped from Albany, N. Y.	7.91	Colonial Beacon
7,500	Quartermaster, Schenectady Gen'l Depot, Schenectady, N. Y.	Destination, Shipped from Wemple, N. Y.	7.02	Colonial Beacon
35,000	Quartermaster, Carlisle Barracks, Carlisle, Pa.	Baltimore, Md.	6.42	Standard of N. J.
56,000	Quartermaster Depot & School, Philadelphia, Pa.	Destination, Shipped from Philadelphia, Pa.	6.7	American
8,000	Quartermaster Artillery Target Range, Tobyhanna, Pa.	Bayonne, N. J.	6.42	Standard of N. J.
52,600	Quartermaster, Ft. Ethan Allen, Vermont	Burlington, Vermont	7.56	Texaco

V-75 Grade

21,000	Aberdeen Proving Ground, Aberdeen, Md.	Destination, Shipped from Baltimore, Md.	8.2	Standard of N. J.
8,000	Delaware Ordnance Depot, Pedricktown, N. J.	Destination, Shipped from Marcus Hook, Pa.	8.818	Texaco
22,500	Ordnance, Picatinny Arsenal, Picatinny, N. J.	Destination, Shipped from Bayonne, N. J.	8.36	Standard of N. J.

G-101 Grade

56,000	Aberdeen Proving Ground, Aberdeen, Md.	Destination, Shipped from Baltimore, Md.	6.53	Standard of N. J.
35,000	Ordnance, Raritan Arsenal, Nixon, N. J.	Destination, Shipped from Bayonne, N. J.	6.26	Standard of N. J.
7,000	Frankford Arsenal, Bridesburg, Philadelphia, Pa.	Destination, Shipped from Philadelphia, Pa.	6.48	Atlantic
14,000	New Cumberland Gen'l Depot, New Cumberland, Pa.	Baltimore, Md.	6.0	Standard of N. J.

REGION TWO

V-68 Grade

80,000	Tennessee Valley Authority, Guntersville, Ala.	Baton Rouge, La.	5.13	Standard of Ky.
80,000	Tennessee Valley Authority, Wilson Dam, Ala.	Shreveport, La.	5.125	Tansel Petro. Co. Minneapolis
28,000	Quartermaster, Ft. McClellan, Ala.	Shreveport, La.	5.125	Tansel Petroleum Co.
13,000	Quartermaster, Maxwell Field, Montgomery, Ala.	Baton Rouge, La.	5.13	Standard of Ky.
40,000	Engineer Corps, Bridge Junction, Ark.	Pearson, Ark.	5.25	Lion Oil Refining Co. El Dorado, Ark.
15,000	Quartermaster, Fort Barrancas, Fla.	Destination, Shipped from Pensacola, Fla.	6.35	Sinclair
8,500	Nat'l Park Service, Fort Oglethorpe, Ga.	Shreveport, La.	5.125	Tansel Petroleum Co.
8,000	Penitentiary, Atlanta, Ga.	Shreveport, La.	5.125	Tansel Petroleum Co.
32,750	Air Corps Detachment, Ft. McPherson, Ga.	Shreveport, La.	5.125	Tansel Petroleum Co.
288,000	Quartermaster, Fort Benning, Ga.	Baton Rouge, La.	5.13	Standard of Ky.
66,000	Quartermaster, Ft. Oglethorpe, Ga.	Shreveport, La.	5.125	Tansel Petroleum Co.
24,000	CCC, Barksdale Field, La.	Shreveport, La.	5.125	Tansel Petroleum Co.
128,500	Quartermaster, Barksdale Field, La.	Shreveport, La.	5.125	Tansel Petroleum Co.
82,000	Quartermaster, Ft. Bragg, N. Carolina.	Destination, Shipped from Wilmington, N. C.	7.308	Texaco
6,000	Charleston Ordnance Depot, N. Charleston, S. Carolina	Charleston, S. Carolina	6.245	Texaco
75,000	Tennessee Valley Authority, Chattanooga, Tenn.	Shreveport, La.	5.125	Tansel Petroleum Co.
80,000	Marine Barracks, Quantico, Va.	Destination, Shipped from Curtis Bay, Md.	7.09	American
40,000	Quartermaster, Ft. Belvoir, Accotink, Va.	Destination, Shipped from Curtis Bay, Md.	7.09	American
7,000	Quartermaster, Ft. Story, Va.	Norfolk, Va.	6.19	Texaco
25,000	Quartermaster, Langley Field, Va.	Destination, Shipped from Norfolk, Va.	7.083	Texaco

V-75 Grade

115,000	Marine Barracks, Quantico, Va.	Destination, Shipped from Curtis Bay, Md.	8.34	American
7,000	[illegible] Ordnance Depot, Pig Point, Va.	Destination, Shipped from Sewells Pt., Va.	8.3	Standard of N. J.

REGION THREE

V-68 Grade

32,000	Naval Training Station, Great Lakes, Ill.	Destination, Shipped from E. Chicago, Ind.	6.58	Sinclair
8,000	Engineer Office, Colona, Ill.	Shreveport, La.	4.97	Crystal Oil Refg. Corp., Shreveport, La.
25,000	Ordnance, Rock Island Arsenal, Ill.	Shreveport, La.	4.97	Crystal Oil Refining Corp.

In View of the Spring Months Just Ahead

it is natural to assume a tremendous market for petroleum products will be created.

Bright stocks, cylinder stocks, and neutrals are undoubtedly within their low price range. Gasoline stocks have been moving in good quantities and a better demand is expected.

The independent dealer can be assured of a definite source of supply at all times based on quality materials. Your inquiries are appreciated.

JAMES B. BERRY SONS' CO., INC. OIL CITY, PA.

Branch Offices: New York City; Chicago, Ill.; Boston, Mass.; Philadelphia, Pa.; Houston, Texas; London, England; Hamburg, Germany; The Hague, Holland.

Refineries: Oil City, Pa.; Emlenton, Pa.; Farmer's Valley, Pa.; St. Mary's, W. Va.
Ocean Terminals: Baltimore, Md.; Tiverton, R. I.; Dorchester, Mass.; Carteret, N. J.; Edgewater, N. J.; Glastonbury, Conn.; Philadelphia, Pa.

ADVERTISING *Clippings*

—here's how to get More Business!

We'll send you newspaper clippings of the best merchandising ideas, as well as copy and layout suggestions from companies of your own type. Each customer chooses just what he wants. Let us put on your desk regularly ad-clippings showing what the leaders are doing; only one idea a month will more than pay for the service. We clip ads from several hundred cities.

If there is any time that Executives want ideas, it is right NOW. We operate the largest ad-clipping bureau in the country. All ads are selected by an experienced staff; no long term contract required.

Use coupon below to learn more about this valuable service and special short term trial offer. No obligation, of course.

VINCENT EDWARDS & CO.
World's Largest Advertising Service Organization
342 Madison Ave., New York City

Please tell me more about your service and special short term trial offer:

Name.....

Company.....

City.....

Peerless MOTORS ARE DEPENDABLE

MOTOR driven service station equipment *must* give unfailing service at all times. That's why the leaders in the petroleum equipment industry continue to specify PEERLESS motors. Their worth has been proved through years of satisfactory performance on the power line for many reputable automotive equipment manufacturers.

You, too, can rely on PEERLESS

THE PEERLESS ELECTRIC CO., WARREN, OHIO

Established 1893

PEERLESS MOTORS

3-Month Gallonage	Govt. Agency	F.O.B. Point and Shipping Point	Max. Price	Contractor
10,000	Proving Ground, Savanna Ordnance Depot, Savanna, Ill.	Okmulgee, Okla.	4.75	Phillips
40,000	Chicago Quartermaster Depot, Chicago, Ill.	Shreveport, La.	4.97	Crystal Oil Refining Corp.
50,000	Quartermaster, Chanute Field, Rantoul, Ill.	Shreveport, La.	4.97	Crystal Oil Refining Corp.
64,584	Quartermaster, Fort Sheridan CCC District, Fort Sheridan, Ill.	Shreveport, La.	4.97	Crystal Oil Refining Corp.
30,000	Quartermaster, Scott Field, Belleville, Ill.	Wood River, Ill.	5.87	Standard
89,800	Quartermaster, Fort Benjamin Harrison, Ind.	Shreveport, La.	4.97	Crystal Oil Refining Corp.
20,000	Quartermaster, Jeffersonville, Ind.	Shreveport, La.	4.97	Crystal Oil Refining Corp.
8,000	Engineer Office, Keokuk, Iowa	Argentine, Kans.	5.31	Sinclair
32,000	Engineer Office, Le Claire, Iowa	Okmulgee, Okla.	4.75	Phillips
16,000	Engineer Office, Mondamin, Iowa	Augusta, Kans.	5.0	Socony-Vacuum
16,000	Engineer Office, Onawa, Iowa	Okmulgee, Okla.	4.75	Phillips
21,650	Quartermaster, Fort Des Moines, Iowa	Augusta, Kans.	5.0	Socony-Vacuum
20,000	Quartermaster, Fort Knox, Ky.	Destination, Shipped from Louisville, Ky.	7.09	Sinclair
40,000	Commanding Officer, Camp Custer, Mich.	Shreveport, La.	4.97	Crystal Oil Refining Corp.
21,000	Quartermaster, Selfridge Field, Mich.	E. Chicago, Ind.	5.99	Sinclair
16,000	Red Lake Indian Agency, Redby, Minn.	Augusta, Kans.	5.0	Socony-Vacuum
24,000	Camp Ripley, Little Falls, Minn.	Superior, Wisc.	6.87	Standard
10,000	Quartermaster, Fort Snelling, Minn.	E. Chicago, Ind.	5.68	Sinclair
50,000	Engineer Corps, St. Louis, Mo.	Wood River, Ill.	5.87	Standard
50,000	Engineer Office			
	A—St. Joseph, Mo.	Sugar Creek, Mo.	5.37	Standard
	B—Glasgow, Mo.	Augusta, Kans.	5.0	Socony-Vacuum
	C—Napoleon, Mo.	Sugar Creek, Mo.	5.37	Standard
	D—Waverly, Mo.	Sugar Creek, Mo.	5.37	Standard
	E—Jefferson City, Mo.	Sugar Creek, Mo.	5.37	Standard
	F—Gasconade, Mo.	Shreveport, La.	4.97	Crystal Oil Refining Corp.
30,000	Engineer Office, Protection, Mo.	Sugar Creek, Mo.	5.37	Standard
21,000	Quartermaster, Jefferson Barracks, Mo.	Okmulgee, Okla.	4.75	Phillips
24,000	Pine Ridge Indian Agency, Rushville, Nebr.	Casper, Wyo.	5.5	Texaco
47,000	Rosebud Indian Agency, Crookston, Nebr.	Casper, Wyo.	5.5	Texaco
8,000	Engineer Office, near Brownville, Nebr.	Augusta, Kans.	5.0	Socony-Vacuum
8,000	Engineer Office, Omaha, Nebr.	Augusta, Kans.	5.0	Socony-Vacuum
5,000	Quartermaster, Fort Crook, Nebr.	Augusta, Kans.	5.0	Socony-Vacuum
22,000	Quartermaster, Fort Omaha, Nebr.	Augusta, Kans.	5.0	Socony-Vacuum
18,000	Turtle Mt. Agency, Belcourt, No. Dak.	Augusta, Kans.	5.0	Socony-Vacuum
16,000	Industrial Reformatory, Chillicothe, Ohio	Shreveport, La.	4.97	Crystal Oil Refining Corp.
6,600	Quartermaster, Columbus Gen'l Depot, E. Columbus, O.	Destination, Shipped from Heath, Ohio	7.0	Standard
57,000	Quartermaster, Fort Hayes, Columbus, Ohio.	Destination, Shipped from Heath, Ohio	7.0	Standard
8,000	Quartermaster, Osborn, Ohio	Shreveport, La.	4.97	Crystal Oil Refining Corp.
8,000	Quartermaster, Wright Field Ohio	Shreveport, La.	4.97	Crystal Oil Refining Corp.
8,000	Veterans Administration, Milwaukee, Wis.	Shreveport, La.	4.97	Crystal Oil Refining Corp.
7,000	Quartermaster, Camp McCoy, Sparta, Wis.	Shreveport, La.	4.97	Crystal Oil Refining Corp.

V-75 Grade

32,000	Naval Training Station, Great Lakes, Ill.	Shreveport, La.	5.47	Crystal Oil Refining Corp.
16,000	Ordnance, Rock Island Arsenal, Ill.	Shreveport, La.	5.47	Crystal Oil Refining Corp.
247,417	Quartermaster, Fort Knox, Ky.	Shreveport, La.	5.47	Crystal Oil Refining Corp.
8,000	Veterans Administration, Chillicothe, Ohio	Shreveport, La.	5.47	Crystal Oil Refining Corp.
8,000	Veterans Administration, Dayton, Ohio	Shreveport, La.	5.47	Crystal Oil Refining Corp.

G-101 Grade

7,000	Quartermaster, Jefferson Barracks, Mo.	Okmulgee, Okla.	3.875	Phillips

REGION FOUR

V-68 Grade

28,150	Quartermaster, Ft. Leavenworth, Kans.	Augusta, Kans.	5.0	Socony-Vacuum
30,000	United Pueblo Indian Agency Albuquerque, N. Mex.	Destination, Shipped from El Paso, Tex.	8.08	Standard of Tex.
48,310	Quartermaster, Ft. Riley, Kans.	Augusta, Kans.	5.0	Socony-Vacuum
120,000	Engr. Corps, Newkirk, N. Mexico	Destination, Shipped from Amarillo, Tex.	7.34	Texaco
101,500	Field Artillery School, Fort Sill, Okla.	Destination, Shipped from Grandfield, Okla.	5.584	Bell Oil & Gas Co. Tulsa
		Motor Tank Truck Delivery	5.574	
14,000	Quartermaster, Fort Reno, Okla.	Destination, Shipped from Sand Springs, Okla.	6.01	Sinclair
49,000	Quartermaster, Brooks Field, Bergs, Tex.	Destination, Shipped from San Antonio, Tex.	6.9	Texaco
14,000	Quartermaster, Duncan Field, Tex.	Destination, Shipped from San Antonio, Tex.	6.9	Texaco
100,500	Quartermaster, Fort Bliss, Tex.	El Paso, Tex.	6.6	Texaco
21,000	Quartermaster, Fort Brown, Brownsville, Tex.	Destination, Shipped from Brownsville, Tex.	7.1	Texaco
15,000	Quartermaster, Fort Clark, Tex.	San Antonio, Tex.	5.62	Texaco
40,000	Quartermaster, Ft. Crockett, Galveston, Tex.	Destination, Shipped from Houston, Tex.	6.3	Sinclair
40,000	Quartermaster, Ft. D. A. Russell, Marfa, Tex.	Destination, Shipped from El Paso, Tex.	7.6	Standard of Tex.
150,000	Quartermaster, Fort Sam Houston, Tex.	Destination, Shipped from San Antonio, Tex.	6.8	Texaco
7,000	Quartermaster, Kelly Field, Tex.	Destination, Shipped from San Antonio, Tex.	6.8	Texaco
23,000	Quartermaster, Fort McIntosh, Laredo, Tex.	Destination, Shipped from San Antonio, Tex.	7.402	Texaco
8,280	Quartermaster, Fort Ringgold, Tex.	Brownsville, Tex.	6.25	Texaco
28,000	Quartermaster, Normoyle Depot, San Antonio, Tex.	Destination, Shipped from San Antonio, Tex.	6.8	Texaco
21,126	Quartermaster, Randolph Field, Tex.	Destination, Shipped from San Antonio, Tex.	6.8	Texaco

V-75 Grade

7,000	Ordnance, San Antonio Arsenal, San Antonio, Tex.	Destination, Shipped from Overton, Tex.	7.8	Western Oil & Fuel Co. Minneapolis
75,000	Quartermaster, Ft. Bliss, El Paso, Tex.	El Paso, Tex.	8.6	Texaco
7,000	Quartermaster, Fort D. A. Russell, Marfa, Tex.	Grandfield Okla.	6.11	Bell Oil & Gas Co.

REGION FIVE

V-68 Grade

53,000	Fitzsimons Gen'l Hospital, Bunell, Colo.	Augusta, Kans.	5.0	Socony-Vacuum
28,000	Quartermaster, Ft. Logan, Colo.	Augusta, Kans.	5.0	Socony-Vacuum
5,000	Forest Service, Cascade, Idaho	Destination, Shipped from Portland, Ore.	11.25	Texaco (Calif.)
50,000	Blackfeet Indian Agency, Ft. Browning, Mont.	Kevin, Mont.	6.47	Big West Oil Co. of Mont., Kevin, Mont.
25,000	Flathead Indian Agency, Dixon, Mont.	Greybull, Wyo.	6.5	Standard
8,000	Ft. Belknap Indian Agency, Harlem, Mont.	Kevin, Mont.	6.47	Big West Oil Co. of Mont., Kevin, Mont.
20,000	Rocky Boy's Indian Agency, Box Elder, Mont.	Kevin, Mont.	6.47	Big West Oil Co. of Mont., Kevin, Mont.
20,000	Glacier National Park, Glacier Park, Mont.	Kevin, Mont.	6.47	Big West Oil Co. of Mont., Kevin, Mont.
90,000	Yellowstone National Park, Gardiner, Mont.	Laurel, Mont.	7.62	Independent Sales Co. Inc., Kansas City, Mo.
10,000	Engr. Corps, Harlem, Mont.	Kevin, Mont.	6.47	Big West Oil Co. of Mont.
200,000	Engr. Corps, Wiota, Mont.	Kevin, Mont.	6.47	Big West Oil Co. of Mont.
6,000	Nat'l Park Service, Thermopolis, Wyo.	Casper, Wyo.	5.5	Texaco (Del.)
36,000	Wind River Agency, Fort Washakie, Wyo.	Casper, Wyo.	5.5	Texaco (Del.)
56,000	Ft. Francis E. Warren, Wyo.	Casper, Wyo.	5.5	Texaco (Del.)

V-75 Grade

72,000	Ft. Peck Indian Agency, Poplar, Mont.	Augusta, Kans.	6.25	Socony-Vacuum
20,000	Glacier Nat'l Park, Belton, Mont.	Sunburst, Mont.	8.75	Texaco (Calif.)

G-101 Grade

80,000	Bu. of Reclamation, Grand Junction, Colo.	Craig, Colo.	5.45	Texaco (Del.)
13,000	Nat'l Park Service, Locomotive Springs, Utah	Destination, Shipped from Casper, Wyo.	9.85	Texaco (Calif.)

REGION SIX

V-68 Grade

10,000	Grand Canyon Nat'l Park, Grand Canyon, Ariz.	Los Angeles, Calif.	6.6	Standard of Calif.
15,000	Bu. of Reclamation, Yuma, Ariz.	Los Angeles, Calif.	8.05	Shell
6,000	Quartermaster, Ft. Huachuca, Ariz.	Los Angeles, Calif.	6.0	Shell
19,225	Letterhan Gen'l Hospital, San Francisco, Calif.	Destination, Shipped from Martinez, Calif.	8.92	Shell
20,000	Quartermaster, Presidio of Monterey, Calif.	Martinez, Calif.	8.92	Shell
23,000	Bu. of Reclamation, Klamath Falls, Ore.	Martinez, Calif.	9.17	Shell
40,000	CCC Motor Pool, Ft. Lewis, Wash.	Destination, Shipped from Tacoma, Wash.	9.42	Signal Oil Co., Los Angeles
		Motor Tank Truck Delivery	9.42	
85,000	Quartermaster, Ft. Lewis, Wash.	Destination, Shipped from Tacoma, Wash.	9.42	Signal Oil Co.
		Motor Tank Truck Delivery	9.42	

V-75 Grade

16,000	Naval Ammunition Depot, Hawthorne, Nev.	Destination, Shipped from Stockton, Calif.	12.008	Petrol Corp. Los Angeles

Markets

At A Glance . . .

MID-CONTINENT: Gasoline unsettled; demand spotty.
MID-WESTERN: Gasoline shipments on upgrade; prices steady.
EASTERN: Less price shading reported on gasoline.
PENNSYLVANIA: Bright stock prices down 1 to 1.5 cents.
GULF: Gas oil sells 0.25 cent lower; gasoline quiet.
CALIFORNIA: New offshore business light; Japs inquire.

Mid-Western

N. P. N. News Bureau

CHICAGO, May 2. — Most reports indicated noticeable improvement in shipments of all grades of gasoline in the Mid-Western area the last week of April. Spot sales were still said to be slow but contract shipments of gasoline were holding up well in the face of the general business recession, sellers said.

Freer offerings of low octane gasoline were indicated in some quarters although prices generally were reported unchanged. Most sellers reported a better demand for regular-grade gasoline.

Michigan refiners reported active buying of straight run gasoline. One or two of them said they had advanced their quotations 0.125 cent to 5.75 cents. Only a couple of refiners reported having sizable inventories. Considerable straight run gasoline was being used for tractor fuel, it was said.

Higher octane gasolines also commanded active trade attention, according to reports. Prices generally remained steady.

More active buying by the farm trade reduced kerosine inventories materially, Chicago marketers said last week. Michigan refiners, however, generally reported lighter demand for kerosine with straight run gasoline commanding more interest from the farm trade.

Range oil quotations generally were at 3.75 to 3.875 cents with comparatively few sales reported.

N. P. N. Refinery Index

The Refinery Index shown below is the calculated average return from refining a barrel of 36 gravity Mid-Continent crude into its various principal products at the current price of crude oil. The index indicates the following margins in cents per barrel between cost of crude and current selling price of products.

Date	Margin
May 2	41.3
Month ago	39.2
Year ago	58.2

Mid-Continent

N. P. N. News Bureau

TULSA, May 2. — Demand for gasoline was spotty in the Mid-Continent last week. Inclement weather and high crude and gasoline stocks all were reported as factors that kept the market unsettled.

Some refiners reported fairly active demand for gasoline but said it was mostly from contract customers. Others said demand was light and their inventories were increasing. The price situation was disturbed at times during the week by occasional offerings said to have been made at price concessions.

East Texas refiners said that current prices prevailing at the Gulf had shut off demand for their gasoline for coastwise and export shipment and their territory at the present time was limited to the southeast and within Texas. Demand from this territory was insufficient to absorb current output and stocks were accumulating, they said.

Kerosine inquiry was more active although some refiners indicated disappointment over the small volume of actual business. At the same time supplies were reported closely held.

Grade 26-70 natural gasoline was offered 0.125 cent lower at 2.5 cents by some manufacturers in Texas. No changes were reported in quotations for shipment from Oklahoma.

N. P. N. Gasoline Index

	Dealer T.w. Cents per	Tank Car Gal.
May 2	10.23	5.91
Month ago	10.23	5.96
Year ago	10.65	6.69

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 12 wholesale markets for regular-grade gasoline.

A wide range of prices was reported for Mid-Continent bright stocks. Several refiners met the lower quotations posted by one large refiner early in April. Export inquiry was said to be more active.

South Texas lubes continued to be unsettled by low-priced offerings of competitive oils from other districts.

Eastern

N. P. N. News Bureau

NEW YORK, May 2. — As the motoring season in eastern states continued to advance with generally favorable driving conditions, there appeared to be less price shading in wholesale markets at eastern seaboard terminals.

One exception to the steadier general situation was the Philadelphia tank car market. Offerings of high octane gasoline at slightly under 6.5 cents, f.o.b. Philadelphia plants, were said to be on the increase. Virtually all sellers said, however, that they had made no change in their quotations the last week of April.

Motor fuel consumption in the east generally was reported by distributors to have climbed above consumption during the same period a year ago.

Wax

NEW YORK, May 2. — Prices for crude scale and refined wax were virtually without change the last week of April. This was true both of domestic and export grades at the Gulf and New York.

An occasional report of an exceptionally low bid for white crude scale wax was heard in the market. Sellers generally, however, indicated they were holding to unchanged prices, ignoring bids 15 to 25 points under current quotations, which they feel are "on bottom".

Several suppliers indicated that foreign movement has taken the play away from domestic shipments, although neither was sufficient to give but nominal support, they said.

Pennsylvania

N. P. N. News Bureau

CLEVELAND, May 2. — The last week of April saw no change in the recent trends of refined oils prices in western Pennsylvania. There were further declines in lubricating oils and fuel oil, while gasoline appeared to be on the upgrade. Kerosine and wax were steady.

Several refiners indicated still further improvement in shipments of motor oils. Increased shipments, however, were largely against contracts, they said, with buyers showing little interest in making commitments in the open market.

At least two refiners reported quoting prices 0.5 to 1.5 cent a gallon low-

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). Prices in cents per gallon except heavy fuel oils in dollars per barrel of 42 gallons, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Gasoline *and* Naphtha

Prices Effective	May 2	April 25
OKLAHOMA		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.375– 4.50	4.375– 4.50
63-66 oct.	4.625– 4.75	4.625– 4.75
67-69 oct.	4.875– 5.00	4.875– 5.00
70-72 oct.	5.25 – 5.50	5.25 – 5.50
60-62, 400 e.p.	4.25 – 4.50	4.25 – 4.50
WESTERN PENNA.		
Bradford-Warren:		
Motor gasoline:		
U. S. Motor (58-62°)	5.125	5.125
Min. 65 oct.	6.50 – 7.00	6.50 – 7.00
Other districts:		
54-56 naphtha	4.875– 5.00	4.875– 5.00
Motor gasoline:		
U. S. Motor (58-62°)	5.125	5.125
Min. 65 oct.	6.50 – 6.625	6.25 – 6.50
CENTRAL MICHIGAN (a)		
Str.-Run Gasoline	(c) 5.50 – 5.75	(c) 5.25 –5.75
U. S. Motor: (Octane L-3)		
67-69 octane	(e)7.75	(b)7.75
70-72 octane	8.00 – 8.25	8.00 – 8.25
CALIFORNIA (3c tax to be added if used in state)		
U. S. Motor:		
54-58, for instate shipment	7.00 – 9.25	7.00 – 9.25
54-58, for outside state shipment	7.25 – 9.00	7.25 – 9.00
58-61, 375-400 e.p., 65 oct. & above	8.00 – 9.75	8.00 – 9.75
N. TEX. (b)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.50 – 4.75	4.50 – 4.75
63-66 oct.	5.00 – 5.50	5.00 – 5.50
67-69 oct.	5.375– 5.625	5.375– 5.625
70-72 oct.	5.625	5.625
60-62, 400 e.p.	4.50 – 4.625	4.50 – 4.625
KANSAS (For Kansas destinations only)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.50 – 4.75	4.625– 4.75
70-72 oct.	5.375– 5.625	5.50 – 5.625
W. TEX. (b)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.75 – 5.00	4.75 – 5.00
63-66 oct.	5.25 – 5.50	5.25 – 5.50
67-69 oct.	5.625– 5.875	5.625– 5.875
70-72 oct.	6.00 – 6.25	6.00 – 6.25
E. TEX.		
60-62, 400 e.p.	(d)4.50	(d)4.50
N. LA. (For shipment to La. & Ark.)		
U. S. Motor: (Octane L-3)		
62 oct. & below	4.50	4.50
63-66 oct.	(e)5.00	(e) 4.875– 5.00
67-69 oct.	5.125	5.125
70-72 oct.	5.625	5.50 – 5.625
ARKANSAS (For shipment to Ark. & La.)		
U. S. Motor: (Octane L-3)		
62 octane & below	(e)4.625	(e)4.625
67-69 oct.	(e)5.125	(e)5.125
OHIO (Quotations of S. O. Ohio. Delivered anywhere in Ohio).		
U. S. Motor	8.25	8.25
Above 65 oct.	8.50	8.50

Natural Gasoline

(Prices to blenders on freight basis shown below. Shipments may originate in any Mid-Continent manufacturing district.)

F.O.B. GROUP 3		
Grade 26-70	2.50	2.50
F.O.B. BRECKENRIDGE		
Grade 26-70	2.50 – 2.625	2.625
CALIFORNIA (F.o.b. plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	7.25	7.25

Kerosine

Prices Effective	May 2	April 25
WESTERN PENNA.		
Bradford-Warren:		
45 w.w.	5.00 – 5.125	5.00 – 5.125
46 w.w.	5.125	5.125
Other districts:		
45 w.w.	5.00	5.00
46 w.w.	5.125	5.125
47 w.w.	5.25	5.25
CENTRAL MICHIGAN (a)		
47-49 w.w.	5.00 – 5.30	5.00 – 5.30
OKLAHOMA		
41-43 w.w.	4.125– 4.25	4.125– 4.25
42-44 w.w.	4.375– 4.50	4.375– 4.50
KANSAS (For Kansas destinations only).		
41-43 w.w.	4.375– 4.625	4.375– 4.625
42-44 w.w.	4.625– 4.875	4.625– 4.875
N. TEX. (b)		
41-43 w.w.	4.50	4.50
E. TEX.		
41-43 w.w.	(d) 4.00 –4.125	(d) 4.00 –4.125
N. LA. (For shipment to La. and Ark.)		
41-43 w.w.	4.375– 4.625	4.375– 4.625
ARK. (For shipment to Ark. and La.)		
41-43 w.w.	(e)4.625	(e)4.625
CALIFORNIA		
40-43 w.w.	5.50 – 7.00	5.50 – 7.00

Gas *and* Fuel Oils

WESTERN PENNA.		
Bradford-Warren:		
36-40	4.00 – 4.25	4.25 – 4.375
Other districts: (Excluding Pittsburgh District Prices).		
36-40	3.625– 3.75	3.75
CENTRAL MICHIGAN (a)		
P.W. Distillate	4.50 – 5.00	4.50 – 5.00
No. 3 gas oil, Str.	4.50 – 4.75	4.50 – 4.75
U.G.I. gas oil	3.50 – 4.25	3.75 – 4.375
Fuel Oils (Vis. at 100):		
500-700 Vis.	(d)2.125–2.625	(d) 2.125–2.625
300-500 Vis.	(d)2.25 –2.75	(d) 2.25 –2.75
100-300 Vis.	(d)2.75 –3.25	(d) 2.75 –3.25
OKLAHOMA		
No. 1 white	3.75 – 3.875	3.75 – 3.875
No. 2 straw	3.375– 3.625	3.375– 3.625
U. G. I. gas oil	(d)3.00 –3.25	(d) 3.00 –3.25
28-30 zero	3.25 – 3.375	3.25 – 3.375
24-26	(e)$0 925	(e) $0 925
18-22	(d)$0.80-$0.85	(d)$0.80-$0.85
14-16	(d)$0.75-$0.825	(d)$0.75-$0.825
KANSAS (For Kans. destinations only).		
No. 1 p.w. fuel oil	4.125– 4.375	4.125– 4.375
10-14 fuel oil	$0.50 –$0.65	$0.55 –$0.65
N. TEX. (b)		
No. 1 white	4.25	4.25
N. LA. (For shipment to La. and Ark.)		
No. 2	3.50 – 3.625	3.50 – 3.625
20-24	$1.10 –$1.15	$1.10 –$1.15
16-20	$0.90 –$0.95	$0.90 –$0.95
10-14	$0.80 –$0.85	$0.80 –$0.85
ARK. (For shipment to Ark. and La.).		
No. 2	(e)3.625	(e)3.625
28-30 gas oil, zero	(e)3.375	(e)3.375
CALIFORNIA		
San Joaquin Valley:		
Heavy fuel	$0.60 –$0.85	$0.60 –$0.85
Light fuel	$0.75 –$0.95	$0.70 –$0.95
Diesel fuel (per gal.)	3.25 – 4.00	3.25 – 4.00
Stove dist. (per gal.)	3.75 – 6.00	3.50 – 6.00
Los Angeles:		
Heavy fuel	$0.60 –$1.00	$0.60 –$1.00
Light fuel	$0.75 –$1.10	$0.70 –$1.10
Diesel fuel (per gal.)	3.00 – 4.00	3.00 – 4.00
Stove dist. (per gal.)	3.25 – 6.00	3.25 – 6.00
San Francisco:		
Heavy fuel	$1.05	$1.05
Light fuel	$1.15	$1.15
Diesel fuel (per gal.)	4.50	4.50
Stove dist. (per gal.)	6.50	6.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Neutral Oils

Prices Effective	May 2	April 25
WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only.)		
Viscous Neutrals No. 3 col. (*Viscosity at 70° F.*)		
200 Vis. (180 at 100°) 420-425 fl.		
0 p.t.	18.00 –18.50	18.00 –18.50
10 p.t.	17.00 –17.50	17.00 –17.50
15 p.t.	16.50 –17.00	16.50 –17.00
25 p.t.	15.00 –16.00	15.00 –16.00
150 Vis. (143 at 100) 400-405 fl.		
0 p.t.	16.50	16.50
10 p.t.	15.50	15.50
15 p.t.	15.00	15.00
25 p.t.	13.50 –14.00	13.50 –14.00
SOUTH TEXAS		
Vis. Color		
Pale Oils: (*Vis. at 100° F.*)		
100 No. 1½-2½	4.75 – 5.00	4.75 – 5.00
200 No. 2-3	6.25 – 6.75	6.25 – 6.75
300 No. 2-3	6.75 – 7.25	6.75 – 7.25
500 No. 2½-3½	7.75 – 8.25	7.75 – 8.25
750 No. 3-4	8.25 – 8.75	8.25 – 8.75
1200 No. 3-4	8.75 – 9.25	8.75 – 9.25
2000 No. 4	9.00 – 9.50	9.00 – 9.50
Red Oils:		
200 No. 5-6	6.25 – 6.75	6.25 – 6.75
300 No. 5-6	6.75 – 7.25	6.75 – 7.25
500 No. 5-6	7.75 – 8.25	7.75 – 8.25
750 No. 5-6	8.25 – 8.75	8.25 – 8.75
1200 No. 5-6	8.75 – 9.25	8.75 – 9.25
2000 No. 5-6	9.00 – 9.50	9.00 – 9.50

Note: South Texas red oil prices shown above cover oils with green cast; blue cast red oils are slightly lower in some cases.

MID-CONTINENT (Vis. at 100° F.; F.o.b. Tulsa basis).		
Pale Oils: (0 to 10 P.P.)		
Vis. Color		
60-85—No. 2	5.50	5.50
86-110—No. 2	6.00	6.00
150—No. 3	9.00	9.00
180—No. 3	10.00	10.00
200—No. 3	10.50	10.50
250—No. 3	11.50	11.50
280—No. 3	12.50	12.50
300—No. 3	13.00	13.00
Red Oils:		
180—No. 5	(e) 9.00	(e) 9.00
200—No. 5	9.50 –10.00	9.50 –10.00
280—No. 5	11.50 –11.75	11.50 –11.75
300—No. 5	(e)11.75	(e)11.75

Note: Viscous oils, 15-25 p.p., generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils. Viscous oils (150-300 vis.), No. 4 color, generally are quoted 0.5c above No. 5 color oils.

CHICAGO (Vis. at 100° F.)		
Pale Oils 0 to 10 p.p.:		
Vis. Color		
60-85—No. 2	7.25	7.25
86-110—No. 2	7.75	7.75
150—No. 3	10.00	10.00
180—No. 3	11.00	11.00
200—No. 3	11.50	11.50
250—No. 3	12.50	12.50
Red Oils:		
180—No. 5	10.00	10.00
200—No. 5	10.50	10.50
250—No. 5	11.50	11.50
280—No. 5	12.50	12.50
300—No. 5	12.75	12.75

Note: Viscous oils, 15 to 30 p.p. are quoted 0.5c lower, 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., are quoted 0.25c lower. To obtain delivered prices in Chicago, add 0.25c per gal.

Cylinder Stocks

MID-CONTINENT (F.o.b. Tulsa basis).		
Bright Stocks:		
190-200 Vis. at 210° D	(e)19.00	(e)19.00
150-160 Vis. at 210° D:		
0 to 10 p.p.	14.50 –16.00	14.50 –16.00
10 to 25 p.p.	13.50 –15.50	13.50 –15.50
25 to 40 p.p.	13.50 –15.00	13.50 –15.00
150-160 vis. at 210° E.	13.50 –15.00	13.50 –15.00

(a) Prices f.o.b. Central Michigan refinery group basis, for shipment within Mich. Shipments may originate at plants outside Central group. (b) For shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments. (c) Excluding Detroit shipment. (d) Nominal. (e) Only one refiner quoting. (f) No price reported.

this is the canning plant
this is the Crude
this is the refinery
this is the chemist
JOBBERS: WRITE, WIRE or PHONE today for complete details of the Exclusive Territory Franchise offered by THE OHIO OIL COMPANY.
THE OHIO OIL COMPANY
ROBINSON, ILLINOIS
GENERAL OFFICES
FINDLAY, OHIO
TULSA, OKLAHOMA
FT. WORTH, TEXAS
MARATHON
Endurance MOTOR OIL

MARATHON MOTOR OILS and MARATHON LUBRICANTS are refined to meet all lubrication requirements and are sealed at the refineries in tamper-proof containers in THE OHIO OIL COMPANY'S own canning plants.

MARATHON MOTOR OILS are refined from 100% Ranger Texas paraffin-base crude, which is unsurpassed for the quality of its lubricating oil content.

THE OHIO OIL COMPANY, one of the world's largest producers of crude oil, guarantees the maintenance of uniform high quality and excellent service with a complete organization that controls its own Production, Transportation, Refining and Marketing.

—that makes the oil that's trouble-free.

THE OHIO OIL COMPANY

GENERAL OFFICES - - - FINDLAY, OHIO

ROBINSON, ILLINOIS TULSA, OKLAHOMA FT. WORTH, TEXAS

er for bright stocks. The 25 pour test No. 8 color stock was offered at 13 cents, off 0.5 cent, and the 10 and 15 pour test oils were down 1 to 1.5 cents at 15 cents and 16 cents, respectively.

Dark cylinder stocks were said to be in fairly good shape and neutral oils also were benefiting considerably from the increased demand for motor oils.

Several small-lot sales of 65 octane gasoline were reported at 6.5 cents from the lower field and late last week all sellers said they had advanced their quotations 0.125 to 0.25 cent to a minimum of 6.5 cents.

Fuel oil continued to be a drug on the market, according to reports of both refiners and resale agents. An occasional sale of 36-40 oil was reported 0.125 cent lower at 3.625 cents from the lower field, and 0.25 cent lower at 4.25 cents from the upper field.

Coastal

N. P. N. News Bureau

NEW YORK, May 2. — Gas oil prices continued to drop at the American Gulf, with a sale of a full cargo for export shipment reported consummated at 3.25 cents for late May lifting.

While many traders here had expressed the opinion that gas oil prices would settle at around 3.5 cents, the product continued to incline lower, although all admit that at the present posted prices of crude each sale represented a loss to the manufacturer.

Reports of other cargo purchases of No. 2 fuel oil for domestic heating purposes at 3.25 cents, the Gulf, also were heard. Although actual purchases at this price could not be confirmed the last week of April, the fact that this material was offered and sold for foreign shipment at 3.25 cents lent credence to the reports.

Despite large-lot foreign buying of Bunker C fuel at the Gulf, offerings of this grade were heard at under 75 cents the past week. Reports of heavy Bunker C, under 8 gravity, being offered at 70 cents and lower also were heard, but firm offerings at under 72.5 cents could not be confirmed.

Gasoline, both foreign and domestic grades, were without feature. Traders said that Roumania continued to dominate the foreign market. Light gasoline was reported offered and sold from Roumania at prices which equaled 4.5 cents, f.o.b. the American Gulf, as compared with 4.875 cents which American refiners said they were asking for 64-66, 375 e.p. gasoline.

California

N. P. N. News Bureau

LOS ANGELES, April 30. — Under commitments made during 1937, California petroleum and products continue to move offshore — principally to Pacific Foreign destinations — at about the same pace established in the early months of last year. But

(*Continued on page* 60)

Fuel Oil . . . . .

TULSA, May 2.—Storing of light fuels was general at most Mid-Continent plants the past week, according to reports of refiners. Demand has gradually tapered off to the point where only occasional orders were being received.

Prices were reported unsettled as refiners pondered whether to push these oils into the market or store them against next season's demand for heating oil.

The breach between supply and demand for heavy fuel continued to widen. Railroads were said to be cutting still further their takings of this oil. Industrial demand was light.

Light demand coupled with slight increase in crude runs at some plants accounted for the top-heaviness of heavy oils, some refiners said. One or two refiners were anticipating a slight pickup in demand for heavy fuels for road building and improvement. One Kansas refiner reduced his quotations 5 cents per barrel.

* * *

NEW YORK, May 2. — Temperatures throughout the east have resulted in a virtual cessation of domestic fuel oil consumption, and wholesale markets for these oils generally were in the doldrums.

Some price shading was encountered on kerosine, and No. 2 and 4 oils at terminal points, but in the face of an almost complete absence of activity, the lower price reports were discounted by most traders.

Industrial fuel oils, however, were being subjected to an increasing amount of "discounting", which has resulted in easier markets, particularly at New York harbor. Unconfirmed reports of offerings of Bunker C fuel at 95 cents and $1.00 per barrel were encountered. Virtually all sellers said they were still asking $1.05 per barrel for this grade.

* * *

CHICAGO, May 2. — Demand for light fuels was spotty the past week as variable temperatures prevailed over the Middle West. Prices for all grades showed little change, however.

Prime white distillate continued to be widely used as a tractor fuel, many Michigan refiners said, while shipments for domestic use evidenced the normal seasonal decline.

Continued industrial lull held down shipments of heavy fuels in the Chicago area, sellers said, although slightly better inquiry was reported for No. 6 oil.

Michigan refiners also attributed lagging movement of heavy fuels to industrial inactivity. Road oil and heavy asphalt fuels were finding a more ready market, however, refiners stated.

MUSKEGON, Mich.—Ralph Walsh, formerly vice president of the Richfield Oil Co., of California and president of the Pan-American Petroleum Co. (California) a Richfield subsidiary, is now associated with the Service Station Equipment Co. in a consulting capacity, it is announced by Walter E. Maun, president.

Walsh went to the Pacific Coast from New York in 1928 after the sale of his interests in the Walburn Petroleum Co. to Richfield. He will continue to maintain offices in Los Angeles and New York in his new connection.

TANK WAGON MARKETS, HEATING OILS

Prices in Effect May 2, 1938

Following are tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

	No. 1	No. 2	No. 3	No. 4
S. O. NEW JERSEY				
Atlantic City, N. J.	8.5	6.5	....	6.5
Newark	8.0	6.5	....	6.5
Annapolis, Md.	....	7.25	....	....
Baltimore	8.0	7.0	....	7.0
Washington, D. C.	8.5	7.75	....	7.75
Norfolk, Va.	8.0	6.75	....	....
Petersburg	8.25	7.0	....	....
Richmond	8.25	7.0	....	7.0
Charlotte, N. C.	9.5	8.5	....	....
Hickory	....	9.0	....	....
Raleigh	9.5	8.0	....	....
Charleston, S. C.	8.625	7.375	....	....
Columbia	9.8	8.5	....	....
Spartanburg	10.6	9.3	....	....

	No. 1	No. 2	No. 3	No. 4
ATLANTIC REFINING Cont'd				
Philadelphia, Pa.	7.75	7.00	7.00	7.00
Allentown, Pa.	8.25	7.50	7.50	7.50
Wilmington, Del.	8.25	7.50	7.50	7.50
Springfield, Mass.	9.00	7.50	....	7.50
Worcester, Mass.	9.00	7.50	....	7.50
Hartford, Conn.	9.00	7.50	....	7.50
S. O. OHIO				
Columbus Division and Cleveland	7.50	7.50	7.00	....
City of Lima	8.00	8.00	7.00	....
Rest of Ohio	8.00	8.00	7.50	....

Note: S. O. Ohio prices are for full compartment hose dumps, bucket dumps are 0.5c per gallon higher.

SOCONY-VACUUM OIL CO. INC.

(S. O. New York Division)				
New York City	*	7.50	7.50	7.50
Albany, N. Y.	*	7.50	7.50	7.50
Rochester, N. Y.	*	7.50	7.50	7.50
Boston, Mass.	*	7.00	7.00	7.00
Bangor, Me.	*	8.00	8.00	8.00
Manchester, N. H.	*	7.50	7.50	7.50
Burlington, Vt.	*	8.00	8.00	8.00
Hartford, Conn.	*	7.00	7.00	7.00
New Haven, Conn.	*	7.00	7.00	7.00
Providence, R. I.	*	7.00	7.00	7.00

*Prices for No. 1 fuel in Socony-Vacuum territory same as for kerosine which see in tank wagon table for various cities; prices change with kerosine.

S. O. INDIANA

Stanolex Fuel and Furnace Oils

	No. 1 Fuel	Stanolex Furnace
Chicago	†8.1	6.8
Indianapolis	...	*11.8
Detroit	...	7.1
Milwaukee	8.4	7.7
Minneapolis	7.8	7.8
St. Louis	7.7	7.0
Kansas City	6.8	6.8

*Includes state tax of 4c.

†This price applies to 1 to 149 gals. deliveries; 150 to 399 gals., 7.1c; 400 gals. and over, 6.8c.

Note: Small-lot deliveries of light fuel oils range up to 2c higher than above quotations.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days) unless otherwise stated. Prices in cents per gallon, except heavy fuel oils in dollars per barrel of 42 gallons, wax and petrolatums in cents per pound in barrels, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Cylinder Stocks (cont'd)

Prices Effective	May 2	April 25
Mid-Continent (cont'd)		
120 Vis. at 210° D:		
0 to 10 p.p.	14.50 -15.125	14.50 -15.125
25 to 40 p.p.	14.25	14.25
600 S.R. Dark Green	5.00 - 7.50	5.00 - 7.50
600 S.R. Olive Green	7.00 - 9.50	7.00 - 9.50
631 S.R.	(b)12.50	(b)12.50
Black Oil	3.50 - 4.00	3.50 - 4.00
CHICAGO (Viscosity at 210°)		
Unfiltered Steam Refined:		
140	9.00	9.00
160	10.00	10.00
200	11.00	11.00
Bright stocks, 160 vis. at 210. No. 8 color:		
0 to 10 p.p.	15.75	15.75
15 to 25 p.p.	14.75	14.75
30 to 40 p.p.	14.25	14.25
E filtered Cyl. Stock	13.50	13.50

Note: To obtain prices delivered in Chicago, add 0.25c per gal.

Prices Effective	May 2	April 25
WESTERN PENNA. (Refiners report no open spot market sales being made to jobbers and give following as their quotations only.)		
600 S.R. filterable	8.50 - 9.50	8.50 - 9.50
650 S.R.	10.50 -11.50	10.50 -11.50
600 fl.	11.00	11.00
630 fl.	14.00	14.00
Bright stock, 145-155 vis. at 210°, 540-550 flash, No. 8 color:		
10 p.t.	16.00	17.50
15 p.t.	15.00	16.00
25 p.t.	13.00	13.50 -14.00

Petrolatums

Prices Effective	May 2	April 25
WESTERN PENNA. (In bbls., carloads; in tank cars, 0.5c less)		
Snow White	6.125- 6.25	6.125- 6.25
Lily White	5.125- 5.25	5.125- 5.25
Cream White	4.125- 4.25	4.125- 4.25
Light Amber	2.625- 2.75	2.625- 2.75
Amber	2.375- 2.50	2.375- 2.50
Red	2.00 - 2.25	2.00 - 2.25

Wax

Prices Effective	May 2	April 25
WESTERN PENNA. (In bbls., carloads, New York)		
122-124 A.m.p., w.c. scale	1.85 - 2.00	1.85 - 2.00
124-126 A.m.p., w.c. scale	1.85 - 2.00	1.85 - 2.00
OKLAHOMA (In bbls. or burlap bags, carloads)		
124-126 A.m.p., w.c. scale	2.10 - 2.25	2.10 - 2.25
CHICAGO (In bags, carload lots. Melting points are E.M.P. (A.S.T.M.) methods; add 3° F. to convert into A.m.p.)		
Fully refined:		
122-124	4.45	4.45
125-127	4.55	4.55
127-129	4.65	4.65
130-132	(d)5.10	(d)5.10
132-134	(d)5.35	(d)5.35
135-137	(d)6.10	(d)6.10

(a) Nominal. (b) Only one refiner quoting. (c) No price reported. (d) Same prices quoted in bags or slabs loose.

MID-WESTERN TANK CAR MARKET

(Prices group 3 basis; origin of shipments unknown)

Gasoline

Prices Effective	May 2	April 25
U. S. Motor: (Octane L-3)		
62 oct. and below	4.00 - 4.375	4.00 - 4.375
63-66 oct.	4.375- 4.625	4.375- 4.625
67-69 oct	4.625- 4.875	4.625- 4.875
70-72 oct	4.625- 5.125	4.75 - 5.125

Kerosine

41-43 w.w.	4.00 - 4.25	4.00 - 4.25
42-44 w.w.	4.25 - 4.50	4.25 - 4.375

(a) Nominal.

Fuel and Gas Oils

Prices Effective	May 2	April 25
Domestic:		
No. 1 p.w.	3.625- 3.875	3.625- 3.875
No. 1 straw	3.375- 3.75	3.375- 3.625
No. 2 straw	3.25 - 3.50	3.25 - 3.50
No. 3	3.125- 3.25	3.125- 3.25
No. 4	(a) $1.05-$1.10	$1.05 -$1.10
No. 5	(a) $0.65-$0.75	$0.65 -$0.75
Range oil	3.75 - 3.875	3.75 - 3.875
Industrial:		
No. 4	(a) $0.90-$1.05	$0.90 -$1.05
No. 5	(a) $0.60-$0.65	$0.60 -$0.65

Prices Effective	May 2	April 25
Industrial (cont'd)		
No. 6	(a) $0.40-$0.55	$0.40 -$0.55
U. G. I. gas oil	2.625- 2.875	2.625- 2.875

Naphtha and Solvent

Stoddard solvent	5.875	5.875
Cleaners' naphtha	6.375	6.375
V. M. & P. naphtha	6.375	6.375
Mineral spirits	5.375	5.375
Rubber solvent	6.375	6.375
Lacquer diluent	7.375	7.375

DAILY GASOLINE PRICES

Daily range of gasoline prices as reported in PLATT'S OILGRAM (Week Ended April 29, 1938)

U. S. Motor, (Octane Number determined according to L-3 Method in Okla., Texas and Mid-Western Districts):	April 25	April 26	April 27	April 28	April 29
62 octane and below:					
Oklahoma	4.375- 4.50	4.375- 4.50	4.375- 4.50	4.375- 4.50	4.375- 4.50
*North Texas	4.50 - 4.75	4.50 - 4.75	4.50 - 4.75	4.50 - 4.75	4.50 - 4.75
West Texas	4.75 - 5.00	4.75 - 5.00	4.75 - 5.00	4.75 - 5.00	4.75 - 5.00
Mid-Western (Group 3 basis)	4.00 - 4.375	4.00 - 4.375	4.00 - 4.375	4.00 - 4.375	4.00 - 4.375
63-66 octane:					
Oklahoma	4.625- 4.75	4.625- 4.75	4.625- 4.75	4.625- 4.75	4.625- 4.75
*North Texas	5.00 - 5.50	5.00 - 5.50	5.00 - 5.50	5.00 - 5.50	5.00 - 5.50
West Texas	5.25 - 5.50	5.25 - 5.50	5.25 - 5.50	5.25 - 5.50	5.25 - 5.50
Mid-Western (Group 3 basis)	4.375- 4.625	4.375- 4.625	4.375- 4.625	4.375- 4.625	4.375- 4.625
67-69 octane:					
Oklahoma	4.875- 5.00	4.875- 5.00	4.875- 5.00	4.875- 5.00	4.875- 5.00
*North Texas	5.375- 5.625	5.375- 5.625	5.375- 5.625	5.375- 5.625	5.375- 5.625
West Texas	5.625- 5.875	5.625- 5.875	5.625- 5.875	5.625- 5.875	5.625- 5.875
Mid-Western (Group 3 basis)	4.625- 4.875	4.625- 4.875	4.625- 4.875	4.625- 4.875	4.625- 4.875
70-72 octane:					
Oklahoma	5.25 - 5.50	5.25 - 5.50	5.25 - 5.50	5.25 - 5.50	5.25 - 5.50
*North Texas	5.625	5.625	5.625	5.625	5.625
West Texas	6.00 - 6.25	6.00 - 6.25	6.00 - 6.25	6.00 - 6.25	6.00 - 6.25
Mid-Western (Group 3 basis)	4.75 - 5.125	4.75 - 5.125	4.75 - 5.125	4.75 - 5.125	4.75 - 5.25
Motor Gasoline, 60-64 oct.					
New York harbor	†6.25 - 6.50	†6.25 - 6.50	†6.25 - 6.50	†6.25 - 6.50	†6.25 - 6.50
Philadelphia district	†6.50 - 6.75	†6.50 - 6.75	†6.50 - 6.75	†6.50 - 6.75	†6.50 - 6.75
Baltimore district	†6.50 - 6.75	†6.50 - 6.75	†6.50 - 6.75	†6.50 - 6.75	†6.50 - 6.75
Motor Gasoline, 65 oct. & above:					
New York harbor	†6.50 - 6.75	†6.50 - 6.75	†6.50 - 6.75	†6.50 - 6.75	†6.50 - 6.75
Philadelphia district	†6.50 - 6.75	†6.50 - 6.75	†6.50 - 6.75	†6.50 - 6.75	†6.50 - 6.75
Baltimore district	†6.50 - 7.00	†6.50 - 7.00	†6.50 - 7.00	†6.50 - 7.00	†6.50 - 7.00
U. S. Motor, 58-62°:					
Bradford-Warren (Western Penna.)	5.125	5.125	5.125	5.125	5.125
Other districts (Western Penna.)	5.125	5.125	5.125	5.125	5.125
Motor Gasoline, Min. 65 oct.:					
Bradford-Warren (Western Penna.)	6.50 - 7.00	6.50 - 7.00	6.50 - 7.00	6.50 - 7.00	6.50 - 7.00
Other districts (Western Penna.)	6.25 - 6.50	6.25 - 6.50	6.25 - 6.50	6.50	6.50

*For shipment to Texas and New Mexico destinations; Group 3 prices are quoted on northern shipment.
†Nominal.
‡Only one refiner quoting.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline do not include taxes; they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect May 2, 1938, as posted by principal marketing companies at their headquarters offices, but subject to later correction.

S. O. New Jersey

Essolene (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Atlantic City, N. J.	7.25	8.75	4	8.5
Newark, N. J.	7.25	8.75	4	8
Annapolis, Md.	8.35	9.85	5	9.5
Baltimore, Md.	7.75	9.25	5	9
Cumberland, Md.	9.15	11.65	5	10
Washington, D. C.	8	9.5	3	9.5
Danville, Va.	8.45	10.95	6	12.9
Norfolk, Va.	7.25	9.75	6	11.5
Petersburg, Va.	7.55	10.05	6	11.7
Richmond, Va.	7.55	10.05	6	11.7
Roanoke, Va.	8.75	11.25	6	12.9
Charleston, W. Va.	8.55	11.05	6	12.6
Parkersburg, W. Va.	7.85	9.35	6	11.2
Wheeling, W. Va.	8.85	10.25	6	12.2
Charlotte, N. C.	9.15	11.65	7	12.6
Hickory, N. C.	9.65	12.15	7	13
Mt. Airy, N. C.	9.45	11.95	7	12.8
Raleigh, N. C.	8.75	11.25	7	12.1
Salisbury, N. C.	9.25	11.75	7	12.7
Charleston, S. C.	7.75	10.25	7	11.1
Columbia, S. C.	8.75	11.25	7	12.1
Spartanburg, S. C.	9.45	11.95	7	12.9

Discount to undivided dealers: Dealer t.w. price less 0.5c per gal.

Price basis to commercial consumers: To contract accounts, purchasing at least one full compartment at a time by hose connection: Effective March 12, 1937, in New Jersey, and March 8 in Maryland, District of Columbia, and in Arlington and Fairfax Counties in Virginia, on yearly purchases: from 2,500 to 100,000 gals., consumer t.w. price at time and place of delivery; 100,000 gals. per year consumer tank car price, plus 0.5c per gal. Generally consumer t.w. price in foregoing states is equivalent of dealer t.w. price, less 0.5c per gal.

Effective May 15, 1937, on Essolene and Esso (by tank wagon) in North and South Carolina, West Virginia and Virginia (except Arlington and Fairfax Counties, which see above), commercial consumers taking deliveries of 50 gals. (West Va. 100 gals.) or more at one time will be billed at the posted consumer t.w. price. Deliveries less than 50 gals. (West Va. 100 gals.) will be billed at 4c per gal. over posted consumer t.w. price. Generally, posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Kerosine Discount: 1c off t.w. price for 25 gals., or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(*S. O. New York Division*)

Socony Mobilgas (*Regular Grade*)

	Consumer Tank Car	"Split" Dealer T.W.	Gasoline Taxes	Kerosine T.W.
Metropolitan N. Y. City: Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	7.5	9.5	*5	8.75
Borough of Richmond (Staten Is.)	7.5	9.5	*5	8.75
Albany, N. Y.	7.5	9.5	5	9
Binghamton, N. Y.	8.7	10.3	5	9
Buffalo, N. Y.	8	9	5	7.5
Jamestown, N. Y.	7.8	10.3	5	8.25
Plattsburg, N. Y.	7.9	9.9	5	9.5
Rochester, N. Y.	8.2	10	5	8.5
Syracuse, N. Y.	8.1	9.5	5	9
Danbury, Conn.	7.8	9.8	4	9
Hartford, Conn.	7.6	9.6	4	8.5
New Haven, Conn.	7.5	9.5	4	8
Bangor, Me.	8.5	10.3	5	9.5
Portland, Me.	8.2	10	5	8.75
Boston, Mass.	8	9	4	8.5
Concord, N. H.	8.8	11	5	9.5
Lancaster, N. H.	9.7	12	5	10.25
Manchester, N. H.	8.6	10.5	5	9
Providence, R. I.	8	9.3	4	8.5
Burlington, Vt.	8.4	10.4	5	9.5
Rutland, Vt.	8.6	10.7	5	9

*Plus 2% city sales tax computed at time of each sale.

Discount to undivided dealers; 0.5c less than "split" dealer t.w.

Price basis to commercial consumers: Effective about Nov. 15, 1936 in New York and New England for tank wagon delivery: monthly purchases of 25,000 gals. or over, pay consumer tank car price at point of delivery, plus 0.5c gal.; monthly purchases of 5,000 to 25,000 gals., pay undivided dealer tank wagon price at point of delivery; monthly purchases of less than 5,000 gals., pay divided dealer tank wagon price at point of delivery. Private consumers pay undivided dealer tank wagon price at point of delivery, plus 2c gal.

Atlantic Refining

Atlantic White Flash Gasoline (*Regular Grade*)

	Commercial Tank Car	Dealer T.W.	S.S.	Gasoline Taxes	Kerosine T.W.
Philadelphia, Pa.	7.25	8.75	12	5	10
Pittsburgh	8	10	15	5	10.5
Allentown	7.75	9.25	**	5	10.5
Erie	8	9.5	**	5	10
Scranton	8	9.5	**	5	10.5
Altoona	8	10	**	5	10.5
Harrisburg	7.5	9	**	5	10.5
Williamsport	8	10	**	5	10.5
Dover, Del.	...	9	**	5	10.5
Wilmington	...	9	**	5	10.5
Boston, Mass.	...	9.5	**	4	8.5
Springfield, Mass.	...	9.5	**	4	8
Worcester, Mass.	...	10.5	**	4	9
Fall River, Mass.	...	8.5	**	4	8.5
Hartford, Conn.	...	9.6	**	4	8
New Haven, Conn.	...	9.5	**	4	8
Providence, R. I.	...	9.3	**	4	8.5
Atlantic City, N. J.	...	8.75	**	4	8.5
Camden, N. J.	...	8.75	**	4	8.5
Trenton, N. J.	...	8.75	**	4	8.5
Annapolis, Md.	...	9.85	**	5	9.5
Baltimore, Md.	...	9.25	**	5	9
Hagerstown, Md.	...	10.35	**	5	10
Richmond, Va.	...	10.05	**	6	11.7
Wilmington, N. C.	...	10.35	**	7	11.3
Brunswick, Ga.	...	10	**	7	*13
Jacksonville, Fla.	...	9.5	**	8	11

*Georgia has kerosine tax of 1c per gal., not included in above price.

**Atlantic Refining transferred stations to dealers; no prices available.

Discount to undivided dealers: Dealer t.w. less 0.5c per gal.

Price basis to commercial consumers: in Penna. and Delaware, effective Mar. 11, 1937, on yearly gasoline purchases to contract accounts taking full compartment hose deliveries, using 100,000 gals. or more per year, tank car price plus 0.5c per gal.; consumers taking less than 100,000 gals., undivided dealer price. Consumers under contract and not under contract, taking less than full compartment delivery, and consumers not under contract taking full compartment delivery, get divided dealer price. Consumers taking less than 25 gals., t.w. delivery, get 4c above undivided dealer price.

Discount on kerosine: Effective Oct. 29, 1936, in Pennsylvania and Delaware, 2c per gal. off t.w. price on t.w. deliveries of 25 gals. or more at one time.

S. O. Ohio

Sohio X-70 Gasoline (*Regular Grade*)

	Consumer T.W.	†Divided Dlr.	Gasoline Taxes	Kerosine T.W.
Ohio State-wide	11.5	10.5	5	*12
Counties where prices are below statewide:				
Columbiana, Defiance and Pickaway	11	10	5	....
Franklin, Knox, and Paulding:	10.5	9.5	5	....
Lucas	10.5	9	5	....

Renown Gasoline (*Third Grade*)

Ohio State-wide	11	10	5	....
Counties where prices are below statewide:				
Columbiana, Defiance and Pickaway	10.5	9.5	5	....
Franklin, Knox, and Paulding:	10	9	5	....
Lucas	10	8.5	5	....
Counties where prices are above statewide:				
Butler, Clermont, Darke, Greene, Hamilton, Miami, Montgomery, Preble and Warren:	11.5	10.5	5	....

S. O. Ohio Cont'd

Kerosine Prices

(*Off Statewide Level*)

Kerosine prices are off statewide level in the following counties:

Allen, Auglaize, Champaign, Columbiana, Darke, Geauga, Greene, Hardin, Logan, Mahoning, Mercer, Preble, Putnam, Shelby, Trumbull and Van Wert	*11.5
Paulding	*11
Ashtabula	*10.5
Fayette, Licking, Madison, Pickaway, Portage and Summit	*8.5

†This price also to authorized agents, exclusive of 0.5c rental. Discount to undivided dealers: 0.5c less than divided dealer t.w.

*Ohio has kerosine tax of 1c per gal., not included in above prices.

Commercial Tank Wagon Q.D.A. to contract accounts: Effective Oct. 20, 1937, thru Ohio (except in 30 counties), on monthly purchases, off posted consumer t.w. price: 0 to 999 gals., 0.5c; 1,000 to 19,999 gals., 1.5c; 20,000 gals. and over, 2.5c. The 30 counties where Q.D.A. differs from statewide are: Allen, Ashtabula, Auglaize, Butler, Champaign, Cuyahoga, Darke, Defiance, Erie, Fulton, Geauga, Hamilton, Hardin, Henry, Logan, Lorain, Lucas, Mahoning, Mercer, Ottawa, Paulding, Putnam, Sandusky, Scioto, Shelby, Trumbull, Van Wert, Washington, Williams and Wood.

Sales tax: Ohio's 3% sales tax, effective Jan. 27, 1935, is added "where assessable, to regular posted prices," S. O. Ohio says.

On kerosine, prices to resellers and commercial consumers are posted generally at 3c per gal. below consumer t.w. price in any quantity, when such prices are on statewide level.

S. O. Kentucky

Crown Gasoline (*Regular Grade*)

	Consumer T.W.	Net Dlr.	Gasoline Taxes	Kerosine T.W.
Covington, Ky.	12.5	10.5	6	11
Lexington, Ky.	13.5	10.5	6	11
Louisville, Ky.	13	10	6	10.5
Paducah, Ky.	13	10	6	10
Jackson, Miss.	12.5	9.5	7	*12
Vicksburg, Miss.	12.5	9.5	7	*12
Birmingham, Ala.	13	10	*8	12
Mobile, Ala.	12	9	*9	11
Montgomery, Ala.	12	10	*9	*12
Atlanta, Ga.	14	11	7	*13
Augusta, Ga.	14	11	7	*13
Macon, Ga.	14	11	7	*13.5
Savannah, Ga.	12.5	9.5	7	*11
Jacksonville, Fla.	12.5	9.5	8	11
Miami, Fla.	12	9	8	12.5
Pensacola, Fla.	13	10	*9	12
Tampa, Fla.	12.5	9.5	8	10.5

Kyso Gasoline (*Third Grade*)

Covington, Ky.	10.5	8	6	....
Lexington, Ky.	11.5	9	6	....
Louisville, Ky.	11	8.5	6	....
Paducah, Ky.	11.5	9	6	....
Jackson, Miss.	11	8.5	7	....
Vicksburg, Miss.	11	8.5	7	....
Birmingham, Ala.	11	8.5	*8	....
Mobile, Ala.	9.5	7	*9	....
Montgomery, Ala.	10.5	8	*9	....
Atlanta, Ga.	12	9.5	7	....
Augusta, Ga.	12	9.5	7	....
Macon, Ga.	12	9.5	7	....
Savannah, Ga.	10.5	8	7	....
Pensacola, Fla.	11	8.5	*9	....

Discounts to all tank wagon consumers: Effective Jan. 4, 1937, thru territory, on Crown gasoline, 3c per gal. below consumer t.w. price; on Kyso, 2.5c below, regardless of quantity purchased, per month.

Discounts on kerosine: Prices in Kentucky are net, but in other states subject to 2c discount.

**Taxes*: In the tax column is included these city and county gasoline taxes at the following points: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia, Mississippi and Montgomery, Ala. have kerosine taxes of 1c per gal., not included in above prices.

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:

Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/5c per gal. in lots up to 25 bbls.; 2/25c per gal. in lots of 25 bbls. or more; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100cc Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. in lots of more than 50 bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c; and Wisconsin, 1/25c.

Kerosine inspection fee only: Iowa, 3/50c; Michigan, 1/5c per gal.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline do not include taxes; they do, however, include inspection fees as shown in general footnote. Gasoline taxes shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect May 2, 1938, as posted by principal marketing companies at their headquarters offices, but subject to later correction.

S. O. Indiana

Red Crown (*Regular Grade*)
Stanolind (*Third Grade*)

	Dealer Prices				
	Red Crown Cons. T.W.	Red Crown T.W.	Stano-lind T.W.	Gaso-line Taxes	Kero-sine T.W.
Chicago, Ill.	11.6	9.6	8.4	4	10.5
Decatur, Ill.	11.6	10.1	8	4	10.5
Joliet, Ill.	11.6	10.1	8.4	4	10.5
Peoria, Ill.	11.6	10.1	9.6	4	10.5
Quincy, Ill.	11.4	9.9	8.8	4	10.3
Indianapolis, Ind.	12.3	10.8	9.6	5	*11.2
Evansville, Ind.	12.1	10.6	7.1	5	*11
South Bend, Ind.	12.6	11.1	9.2	5	*9.4
Detroit, Mich.	11.3	9.8	9.3	4	10
Grand Rapids, Mich.	10.8	9.8	9.8	4	9.7
Saginaw, Mich.	12.3	10.8	10.3	4	9.3
Green Bay, Wis.	12.4	10.9	10.2	5	10.3
Milwaukee, Wis.	11.8	10.3	9.5	5	10.7
La Crosse, Wis.	12	10.5	10	5	10.9
Minneapolis-St. Paul	12	10.5	10	5	10.9
Duluth, Minn.	12.4	10.9	10.4	5	11.3
Mankato, Minn.	12	10.5	10	5	10.9
Des Moines, Ia.	11.4	9.9	7.5	4	*8.3
Davenport, Ia.	11.6	10.1	9.6	4	*10.5
Mason City, Ia.	11.8	10.3	9.8	4	*10.7
St. Louis, Mo.	11.2	9.7	7.5	*4	10.1
Kansas City, Mo.	10.9	9.4	8.9	*4	9.8
St. Joseph, Mo.	10.9	9.4	8.9	*4	9.8
Fargo, N. D.	13.2	11.7	11.2	4	12.1
Minot, N. D.	14.5	13	12.5	4	13.4
Huron, S. D.	12.5	11	10.5	5	11.4
Wichita, Kans.	10.4	8	7.4	4	8.3

*Taxes: in the tax column is included these city and state gasoline taxes at following points: Kansas City, St. Joseph and St. Louis, 1c city tax. Indiana has 4c, and Iowa has 3c kerosine tax per gal., not included in above prices.

Discount to commercial consumers: Effective Jan. 1, 1935, thru territory, except Michigan effective Feb. 1, on purchases per month, discount off t.w. prices; all gasolines, 25 to 1,000 gals., at t.w. price; 1,000 gals., or more, 1.5c off t.w. on Ethyl and Red Crown, and 1c on Stanolind (latter effective June 9, 1937). Minimum delivery is 25 gals.

S. O. Nebraska

Standard Red Crown Gasoline (*Regular Grade*)

	T.W.	Dealer	Gaso-line Taxes	Kero-sine T.W.
Omaha, Neb.	12	10.5	6	10.8
McCook	11.5	9	6	9.5
Norfolk	12.4	10.9	6	10.3
North Platte	12.8	10.9	6	11.2
Scottsbluff	13.5	10.3	6	12.3

Discounts to commercial consumers: for tank wagon deliveries covered only by Standard Commercial Consumer Contract, effective January 1, 1935.

S. O. Louisiana

Esolene (*Regular Grade*)

	Consumer Tank Car	Dealer T.W.	Gaso-line Taxes	Kero-sine T.W.
Little Rock, Ark.	7.25	9.75	7.5	11.5
Alexandria, La.	7	9.5	8	*9.5
Baton Rouge, La.	6.5	9	8	*11
New Orleans, La.	6.5	9	*10	*10
Lake Charles, La.	7.5	10	8	*11.5
Shreveport, La.	6	8.5	8	*8.5
Lafayette, La.	7.5	10	8	*11.5
Bristol, Tenn.	9.75	11	8	14.5
Chattanooga, Tenn.	9	11.5	8	13.5
Knoxville, Tenn.	9.5	12	8	14
Memphis, Tenn.	7.5	10	8	12
Nashville, Tenn.	8.5	11	8	10.5

*New Orleans gasoline tax includes 7c state, 1c federal, and 2c parish tax. Louisiana has kerosine tax of 1c per gal.; in addition New Orleans has 1c parish tax, not included in above prices.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Price basis to commercial consumers: Effective May 15, 1937, thru territory; commercial consumers taking 50 gals. or more at one time will be billed at posted consumer t.w. price; those taking less than 50 gals. at one time will be billed at 4c per gal. over posted consumer t.w. price. Generally, the posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Humble Oil & Refining Co.

Humble Motor Fuel (*Regular Grade*)

	*T.W.	S.S.	Gaso-line Taxes	Kero-sine T.W.
Dallas, Tex.	9	13	5	8
Ft. Worth, Tex.	9	13	5	8
Houston, Tex.	9.5	13.5	5	8
San Antonio, Tex.	8.5	12.5	5	8

U. S. Motor Gasoline (*Third Grade*)

Dallas, Tex.	7	10	5
Ft. Worth, Tex.	7.5	10	5
Houston, Tex.	8.5	11.5	5
San Antonio, Tex.	7.5	10.5	5

*Price is t.w. price to all classes of dealers and consumers.

Price basis to "open" dealers: discount off posted retail price: when posted retail price, including all taxes on Esso motor fuel is: 19.1c per gal. and above, discount is 3.5c; 19c to 18.1c, 3c, and 18c and below, 2.5c. Humble motor fuel, 17.1c and above, 3.5c; 17 to 16.1c, 3c; and 16c and below, 2.5c; U. S. motor fuel, 15.1c and above, 2.5c; 15 to 14.1c, 2c; and 14c and below, 1.5c.

Continental Oil

Conoco Bronze (*Regular Grade*)
Demand (*Third Grade*)

	—Dealer Prices— Conoco Bronze	Demand	Gaso-line Taxes	Kero-sine T.W.
Denver, Colo.	9	8	5	11.5
Grand Junc., Colo.	14	13	5	15
Pueblo, Colo.	8	7	5	10.5
Casper, Wyo.	12	11	5	11.5
Cheyenne, Wyo.	11	7	5	13
Billings, Mont.	13.5	12	6	13
Butte, Mont.	13.5	10.5	6	15.5
Great Falls, Mont.	13.5	12.5	6	15.5
Helena, Mont.	13.5	12.5	6	15.5
Salt Lake City, Utah	13	10	5	16
Boise, Ida.	15.5	14.5	6	18
Twin Falls, Ida.	15	14	6	18
Albuquerque, N. M.	11	10	†6.5	12
Roswell, N. M.	11	8.5	†6.5	10.5
Santa Fe, N. M.	12	9.5	*7	12
Muskogee, Okla.	9.5	8	5	7
Oklahoma City, Okla.	9	6	5	8
Tulsa, Okla.	9	6	5	6
Ft. Smith, Ark.	9.25	8.5	5	8
Little Rock, Ark.	9.75	7.625	7.5	9.5
Texarkana, Ark.	9	6	5	8.5

†Includes city tax of 0.5c.
*Includes 1c city tax.

S. O. California

Standard Gasoline (*Regular Grade*)

	T.W	S.S.	Gaso-line Taxes	Kero-sine T.W.
San Francisco, Cal.	13.5	14.5	4	11.5
Los Angeles, Cal.	13	14	4	10
Fresno, Cal.	14.5	15.5	4	12.5
Phoenix, Ariz.	15.5	16.5	6	*12.5
Reno, Nev.	15.5	16.5	5	13.5
Portland, Ore.	14	15	6	13.5
Seattle, Wash.	14	15	6	13.5
Spokane, Wash.	16.5	17.5	6	16
Tacoma, Wash.	14	15	6	13.5

Flight Gasoline (*Third Grade*)

San Francisco, Cal.	12	13	4	....
Los Angeles, Cal.	11.5	12.5	4	....
Fresno, Cal.	13	14	4	....
Reno, Nev.	14	15	5	....
Phoenix, Ariz.	14	15	6	....
Portland, Ore.	12.5	13.5	6	....
Seattle, Wash.	12.5	13.5	6	....
Spokane, Wash.	15	16	6	....
Tacoma, Wash.	12.5	13.5	6	....

*Arizona has kerosine tax of 5c per gal., not included in above prices.

Discount to dealers: on gasoline, off t.w. price on Standard Ethyl and Standard Gasoline, to 100% dealers, 3c; to split dealers, 2c; on Flight gasoline, both 100% and split dealers, 2c.

On Stanavo Aviation Gasoline, to all classes of dealers, 3c off t.w.

To commercial consumers: off tank wagon price on single deliveries of 40 gallons and over. Stanavo Aviation, Standard Ethyl and Standard Gasolines, 3c. Flight Gasoline, 2c per gallon. Tank wagon delivery, less than 40 gals., 1c per gal. above posted t.w. price. Discounts on kerosine: in tank cars, 3c off tank truck price; plant deliveries to jobbers, 2.5c below tank truck price.

Canada

PRICES OF IMPERIAL OIL LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-Star Imperial Gasoline (*Regular Grade*)

	T.W.	Gasoline Taxes	Kero-sine T.W.
Hamilton, Ont.	16	6	17
Toronto, Ont.	16	6	17
Brandon, Man.	21.1	7	22.3
Winnipeg, Man.	20.5	7	20.7
Regina, Sask.	20	7	22
Saskatoon, Sask.	22.8	7	24.8
Edmonton, Alta.	19.5	7	21.5
Calgary, Alta.	17	7	19
Vancouver, B. C.	16	7	23
Montreal, Que.	15	6	17.5
St. John, N. B.	14.5	10	18.5
Halifax, N. S.	14.5	10	18.5

Discounts to undivided dealers, 1c off t.w. price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price, thru territory.

Aviation Gasoline

Following are tank car and/or tank wagon prices, as indicated, of aviation gasoline in principal marketing territories (Stanavo Aviation Gasoline in all territories except where otherwise noted).

S. O. NEW JERSEY

	*Ethyl T.C.	Tank Car	T.W.
Bayonne, N. J.	19.5	9.5	12.5
Baltimore, Md.	....	10	13
Washington, D. C.	....	....	13.5
Richmond, Va.	....	....	14.7
Greensboro, N. C.	....	....	15.7
Raleigh, N. C.	....	....	17.6
Charleston, W. Va.	....	....	12.2

*This is Stanavo Ethyl Aviation Gasoline, 100 octane number, tank car price.

COLONIAL BEACON OIL CO.

	T.W.
Brooklyn, N. Y.	12.8
Buffalo, N. Y.	14.5
Boston, Mass.	15

S. O. PENNSYLVANIA

Philadelphia, Pa.	13.6
Pittsburgh, Pa.	14.4

S. O. LOUISIANA

New Orleans, La.	13.3
Shreveport, La.	13.6

Prices in above four territories are on a 74 octane grade aviation gasoline except where otherwise noted. An 80 octane product generally brings 0.5c premium and an 87 octane product, 1.5c premium over the 74 octane grade.

Note: S.a. prices in above four territories are generally 6c over t.w. prices. Above t.w. prices are net, with no discounts allowed for quantity purchases. T.w. prices are generally tank car price, plus freight, plus 2.5c per gal.

S. O. OHIO
Thru Ohio
Stanavo Ethyl Aviation

	Consumer T.W.	Gasoline Taxes
73 octane	15.5	5
80 octane	16.5	5
87 octane	17.5	5

Discounts: For delivery on contract to hangar operators and resellers: 2c below consumer posted t.w. price, shown above.

S. O. INDIANA
Stanavo Ethyl Aviation Gasoline, 73 Octane Number

Chicago, Ill.	14.9	4
Detroit, Mich.	16.5	4
Milwaukee, Wis.	15.1	5
Minneapolis, Minn.	15.3	5
St. Louis, Mo.	14.5	3
Kansas City, Mo.	14.2	*4
Fargo, N. D.	16.5	4
Huron, S. D.	15.8	5

*Includes 1c city tax

HUMBLE OIL & REFINING CO.

	Tank Car
Baytown, Tex.	8.5

CONTINENTAL OIL CO.
Conoco Special Gasoline

	Dealer	Gasoline Taxes
Denver, Colo.	14.5	5
Cheyenne, Wyo.	15	5
Helena, Mont.	16.5	6
Salt Lake City, Utah	17.5	5
Albuquerque, N. M.	14	*6.5

*Includes city tax of 0.5c.

S. O. CALIFORNIA
Stanavo Aviation Gasoline

	T.W.	
Phoenix, Ariz.	17.5	6
Los Angeles, Cal.	15	4
San Francisco, Cal.	15.5	4
Reno, Nev.	17.5	5
Portland, Ore.	16	6
Seattle, Wash.	16	6
Spokane, Wash.	18.5	6

Note: For discounts, etc., see note under Standard and Flight gasoline above.

TANK WAGON MARKETS

Tank car, tank wagon, dealer, and service station prices for gasoline **do not include taxes;** *they do, however, include inspection fees as shown in general footnote. Gasoline taxes, shown in separate column, include 1c federal, and state taxes; also city and county taxes as indicated in footnotes. Kerosine tank wagon prices also do not include taxes; kerosine taxes, where levied, are indicated in footnotes. Discounts to various classes of buyers also are shown in footnotes. These prices in effect May 2, 1938, as posted by principal marketing companies at their headquarters offices, but subject to later correction.*

Naphtha (In Tank Wagon)

S. O. NEW JERSEY

Posted Tank Wagon Prices

	Mineral Spirits	V.M.&P.
Newark, N. J	11.5	15.5
Baltimore, Md	15.5	....
Washington, D. C	15	....

Discounts: Buyers taking following quantities, at one time, get these discounts: Newark, 2c per gal. on 200 gals. or more; less than 200 gals., 0.5c higher price. Baltimore 2c off on 25 to 100 gals. and 3c on over 100 gals. Washington, 2c off to contract buyers.

SOCONY-VACUUM OIL CO.

Buffalo, N. Y	13	14
New York City	9.5	11.5
Rochester, N. Y	13	15
Syracuse, N. Y	14	15
Boston, Mass	13.5	14
Bridgeport, Conn	12.5	14
Hartford, Conn	12	13.5
Providence, R. I	13.5	14.5

ATLANTIC REFINING CO.

Philadelphia, Pa	11.5	12.5
Lancaster, Pa	13	14
Pittsburgh, Pa	12.5	14.5

Note: Prices for Mineral Spirits also apply to Stoddard Solvent; and prices for V.M.&P. Naphtha apply also to Light Cleaners Naphtha.

S. O. OHIO

	S.R. Solvent	V.M.&P. Naphtha
Thru Ohio	12.5	13.5

Note: V.M.&P. Naphtha prices also apply on Dry Cleaners naphtha and special Varnolene; Varnolene and Sohio Solvent 0.5c below these prices. Discounts to contract consumers, off t.w. price: 300 to 999 gals., 0.5c; 1,000 to 2,499 gals., 0.75c; 2,500 to 4,999 gals., 1c; 5,000 or more gals., 1.5c.

S. O. INDIANA

(Prices include state and federal taxes)

	Oleum Spirits	V.M.&P. Naphtha	Stanisol
Chicago, Ill	16.2	16.5	15.9
Detroit, Mich	19.7	18.7	19.8
Kansas City, Mo	14.7	15.7	14.7
St. Louis, Mo	15.0	16.0	13.9
Milwaukee, Wis	19.6	20.6	19.6
Minneapolis, Minn	19.8	20.8	17.7

Note: Prices for V. M. & P. apply also to Light Cleaners Naphtha. All prices, with exception of Missouri points, include state tax. Prices shown are base prices, before discounts.

Naphtha (In Tank Cars)

In Tank Cars (F. o. b. refinery or seaboard terminal except Ohio, delivered price.)

	V.M.&P. Naphtha	Solvent
Baltimore	10.5	9.5
New York Harbor	10	9
Philadelphia district	10.5	9
Boston	10.5	9.5
Providence	10.5	9.5
Ohio points, delivered	8.875	*8

*This is on rubber solvent.

Note: In Ohio, prices on D.C. naphtha and special Varnolene are same as V.M.&P.; on Varnolene and Sohio Solvent, prices are 0.5c less than on V.M.&P.

Latest Changes

From April 26 to May 2 inclusive. Dates and amounts of changes shown. See table for full current prices.

S. O. Ohio—X-70 and Renown:
Divided and undivided dealer, cut 0.5c, Lucas County, April 28.

S. O. Nebraska—Standard Red Crown:
Dealer cut 0.3c, McCook, Apr. 26.

Corrections

Notation of amount of change and dates not previously shown in table. Table in this issue is corrected to show these changes.

S. O. Nebraska—Standard Red Crown:
T. w. cut 0.3c, McCook, Apr. 23.

Kerosine:
T. w. cut 0.8c, McCook, April 23.

Continental Oil—Demand:
Thru typographical error, dealer price at Boise has been published as 13.5c, instead of 14.5c, since Jan. 26th issue. Correct price is 14.5c effective Mar. 31, 1937.

S. O. California—Kerosine:
Phoenix and Reno, t. w. up 0.5c, Apr. 11.

California

(Continued from page 56)

suppliers are noting a decided dearth of new business.

Except for an inquiry from the Far East for quotations on a cargo of 24 gravity "Japanese" diesel oil, no active inquiries were reported received in the west coast bulk market the past week.

Suppliers were waiting with considerable interest the opening of bids in Washington May 3 on approximately 9,000,000 barrels of U. S. Navy fuel oil to be delivered for fleet maneuvers in the Pacific during the 1938-39 fiscal year. A better grade than Bunker "C", this product requires the addition of 8 to 12 per cent gas oil blend to meet specifications. Bids will also be made on about 500,000 barrels of diesel oil at this time.

In domestic markets, some independent refiners were asking 7.25 cents at the rack, exclusive of all tax, for gasoline but some were finding it difficult to obtain this price in the face of a slow market.

Several lots of off-specification motor fuel were said to have been unloaded at 6.75 cents and prices only slightly above 7 cents prevailed at one or two plants.

Brazil Assumes Control of Oil

WASHINGTON—Under the terms of a new decree-law, the Brazilian government has declared that subsoil deposits of petroleum, natural gas, and rare gases are the property of the state, according to a report to the U. S. Department of Commerce from the American commercial attache at Rio de Janeiro.

The new law which went into effect April 12 is incorporated in the Mining Code of July 10, 1934, the report stated.

Under the decree, private ownership of mineral resources or claims of such deposits are not legally valid, since no commercial deposits in this category were discovered before or during the period stipulated by the existing mining code in which private ownership of mineral resources would be recognized upon due registration and proof of the mining property.

To this extent the decree is similar to the expropriation order of President Lazaro Cardenas of Mexico.

The government of Brazil is given authority, however, to enter into contracts with nations or foreign oil companies for drilling and extraction of oil.

U. S. Oil Exports Up 26%

WASHINGTON—U. S. exports of petroleum and products during the first quarter of 1938 were 26 per cent greater in value than in the same period of 1937, according to preliminary figures released by the Bureau of Foreign and Domestic Commerce.

Value of exports during the three-month period totaled $91,062,000, compared with $72,142,000 in 1937.

Crude exports amounted to 17,402,000 barrels, valued at $25,624,000, as against 10,568,000 barrels, valued at $14,316,000 in the January-March period last year.

Motor fuel exports jumped from 6,698,000 barrels, valued at $16,945,000, in 1937 to 8,477,000 barrels, valued at $22,069,000 during the first three months of this year.

A slight decline was noted in exports of lubricating oil—2,380,000 barrels in the first quarter of 1937, and 2,252,000 barrels in the same period this year.

Pennsylvania Refinery Lubricating Oil Inventory

(Issued by National Petroleum Association)

	April 14 Gallons	April 21 Gallons
1. **Raw Long Residuum** (Including all raw long residuum below, and not salable, as 600 fire)	1,593,704	1,342,843
2. **600 Steam Refined** (Includes all steam refined stock commonly sold or used as 600 and as raw material for bright stocks)	6,726,876	6,643,736
3. **Other Steam Refined** (Not included in 1 and 2 above)	5,858,785	5,902,094
4. **Finished Dewaxed Long Res.**	3,008,106	2,771,615
5. **Bright Stock** (Does not include any material reported in 4. above)	23,935,561	23,986,302
6. **Viscous Neutral,** below 180 vis. but not below 142 vis. @ 100	8,599,261	8,825,732
7. **Viscous Neutral,** 180 vis. @ 100 and above	9,432,795	9,567,192

SEABOARD MARKETS, EXPORT AND COASTWISE

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). In cargo markets, spot shipment is 90 days. Prices in cents per gallon, except heavy fuel oil in dollars per barrel, in tank car lots, f.o.b. refineries or seaboard terminals in districts designated, unless otherwise noted. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M.D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Eastern Domestic

(Inter-refinery and export prices not included.)

MOTOR GASOLINE

Prices Effective	May 2	
District:	(a)60-64 Oct.	(a)65 Oct. & Above
N. Y. harbor	6.25 – 6.50	6.50 – 6.75
(b)N.Y.harbor	6.00 – 6.25	6.25 – 6.50
Philadelphia	6.25 – 6.50	6.50 – 6.75
Baltimore	6.25 – 6.50	6.50 – 6.75
Norfolk	6.75 – 7.00	7.00 – 7.25
Wilmington, N.C.	6.75 – 7.00	7.00 – 7.25
Charleston, S. C.	6.75 – 7.00	7.00 – 7.25
Savannah	7.00 – 7.25	7.25 – 7.50
Jacksonville	7.00 – 7.25	7.25 – 7.50
Portland	7.00 – 7.50	7.25 – 7.75
Boston	6.25 – 7.25	6.50 – 7.50
Providence	6.50 – 7.25	6.75 – 7.50

(a)Prices nominal. (b)Barge lots.

WATER WHITE KEROSINE

District:			
N. Y. harbor	5.25 – 5.50	Charleston	5.75
(b)N. Y. harbor	5.00 – 5.125	Savannah	5.75
Philadelphia	5.50	Jacksonville	5.75
Baltimore	5.50	Portland	5.85
Norfolk	5.50	Boston	5.50
Wilmington, N.C.	5.75	Providence	5.50

(b)Barge lots.

(c)FUEL OILS

	N. Y. harb.	N. Y. harb. barges
No. 1	5.125– 5.50	5.00 – 5.125
Nos. 2-3	4.125– 4.50	4.125– 4.375
No. 4	4.00 – 4.50	3.875– 4.375
No. 5	$1.25	.....
No. 6	$1.05	.....
	Phila. dist.	**Balt. dist.**
No. 1	5.50	5.50 – 5.75
Nos. 2-3	4.50	4.50 – 4.75
No. 4	4.25 – 4.50	4.50 – 4.75
No. 5	$1.25	$1.25
No. 6	$1.05	$1.05
	Bost. dist.	**Prov. dist.**
No. 1	5.50 – 6.00	5.50 – 6.00
Nos. 2-3	4.50 – 5.00	4.50 – 5.00
No. 4	4.50 – 5.00	4.50 – 5.00
No. 5	$1.35	$1.30
No. 6	$1.05†	$1.05

(c)Fuel oils meet specifications of U. S. Commercial Standards CS12-35.

District:	(b)Bunker C Fuel	(b)Diesel Oil
N. Y. harbor	(e)$1.05	(d)$1.75
Philadelphia	(e)$1.05	(d)$1.85
Baltimore	(e)$1.05	(d)$1.85
Norfolk	(c)$1.05	$1.995
Charleston	$1.00	$1.95
Savannah	(c)$1.00	$2.205
Jacksonville	(c)$1.00	$2.205
Tampa	(c)$0.95	$2.205
Portland	$1.15	$2.05
Boston	(e)$1.05	(d)$1.85
Providence	$1.05	$1.95

(b)In ship's bunkers.
(c)For barging add 5c per bbl.
(d)For barging add 6.5c to 7.5c per bbl.
(e)For barging add 5c to 6c per bbl.

	Gas Oil 28-34 Gravity	Diesel Oil Shore Plants
N. Y. harbor	4.25 – 4.50	4.25 – 4.50
Philadelphia dist.	4.50 – 4.75	....
Baltimore dist.	4.50 – 4.75	....
Norfolk dist.	4.75 – 5.00	....
Savannah dist.	.....	5.00
Jacksonville dist.	.....	5.00

Pacific Export

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gal., except where otherwise noted.)

Prices Effective	May 2	April 25
U. S. Motor, under 65 oct.	5.00 – 5.125	5.00 – 5.125
400 e.p. blend, under 65 oct.	5.125– 5.25	5.125– 5.25
400 e.p. blend 65 oct. & above	5.25 – 5.375	5.25 – 5.375
(b)38-40 w.w.kerosine	4.25 – 4.75	4.25 – 4.75
41-43 w.w kerosine	4.75 – 5.00	4.75 – 5.00
44 w.w. kerosine	5.25	5.25
In Cargo lots, per bbl.		
Diesel fuel, 24° & above	$1.30 –$1.35	$1.30 –$1.35
Diesel fuel, under 24°	$1.25 –$1.30	$1.25 –$1.30
(b)30-34 diesel(gas oil)	$1.30 –$1.45	$1.30 –$1.45
(c)Grade C fuel oil	$0.75 –$0.80	$0.75 –$0.80

Note: For San Francisco cargo prices, add 5c per bbl. to above cargo prices.

(b)150 fire point.

Prices Effective	May 2	April 25
In Ships' Bunkers, or deep tank lots, per bbl.:		
(b)Diesel fuel oil	$1.625–$1.65	$1.625–$1.65
(c)Grade C fuel oil	$0.90 –$1.00	$0.90 –$1.00

(b)Pacific specification 200. (c)Pacific specification 400.

Cased Goods: (Per case		
U. S. Motor	$1.40 –$1.525	$1.40 –$1.525
400 e.p. blend, under 65 octane	$1.50 –$1.60	$1.50 –$1.60
400 e.p. blend, 65 oct. & above	$1.60 –$1.70	$1.60 –$1.70
(b)40-43 w.w. kerosine	$1.30 –$1.40	$1.30 –$1.40
Kerosine, p.w	$1.25 –$1.35	$1.25 –$1.35

(b)150 fire point.

New York Export

(Cents per gal. in bbls. F.a.s. New York)

CYLINDER OILS (Pennsylvania Products)

Bright stock:		
Light, 25 p.t.	20.50 –21.00	21.50
Neutral oil:		
200 3 color, 25 p.t	23.50	23.50
150 3 color, 25 p.t.	21.50	21.50
600 s.r., unfiltered	15.00 –15.50	15.50 –16.00
650 s.r., unfiltered	17.00 –17.50	17.50
600 fl., s.r.	17.50	17.50
630 fl., s.r.	21.00 –21.50	21.00 –21.50

Wax, Domestic *and* Export

(A.S.T.M. Tests. Melting points, however, are A.M.P., 3° higher than E.M.P. Export prices, f.a.s., carloads. Domestic prices, f.o.b. refineries in New Orleans & New York districts in bags, carloads, with 0.2c discount allowed for shipment in bulk, except where noted below. Scale solid; fully refined, slabs in bags)

Prices Effective	May 2	
	New York	
	Domestic	Export
124-6 Y.C. scale	1.85 – 2.00	1.85 – 2.00
122-4 W.C. scale	1.85 – 2.00	1.85 – 2.00
124-6 W.C. scale	1.85 – 2.00	1.85 – 2.00
123-5 Fully rfd.	4.30	3.50
125-7 Fully rfd.	4.35	3.50 – 3.625
128-30 Fully rfd.	4.45	3.75 – 3.875
130-2 Fully rfd.	4.55	4.125
133-5 Fully rfd.	(a)5.00	4.50 – 4.625
135-7 Fully rfd.	(a)5.25	5.00 – 5.125
	New Orleans	
	Domestic	Export
124-6 Y.C. scale	1.85 – 2.00	1.85 – 2.00
122-4 W.C. scale	1.85 – 2.00	1.85 – 2.00
124-6 W.C. scale	1.85 – 2.00	1.85 – 2.00
123-5 Fully rfd.	4.30	3.50
125-7 Fully rfd.	4.35	3.50 – 3.625
128-30 Fully rfd.	4.45	3.75 – 3.875
130-2 Fully rfd.	4.55	4.125
133-5 Fully rfd.	(a)5.00	4.50 – 4.625

(a) Shipment either in bags or in bulk.

Gulf Coast

(F.o.b. ship, Gulf oil terminals; minimum 20,000 bbls.; representing traders' opinions)

Prices Effective	May 2	April 25
For Domestic shipment:		
MOTOR GASOLINE		
59 oct. & below	5.00 – 5.125	5.00 – 5.125
60-64 oct.	5.125– 5.25	5.125– 5.25
65-67 octane	5.25 – 5.375	5.25 – 5.375
68-70 octane	5.375– 5.625	5.375– 5.625
FUEL OILS		
No. 1	4.50 – 4.625	4.50 – 4.625
No. 2	3.25 – 3.50	3.50
KEROSINE		
41-43 w w	4.50 – 4.625	4.50 – 4.625
For Export Shipment:		
GASOLINE		
U. S. Motor	4.75 – 4.875	4.75 – 4.875
60-62, 400 e.p.	4.75 – 4.875	4.75 – 4.875
61-63, 390 e.p.	4.875– 5.00	4.875– 5.00
64-66, 375 e.p.	4.875– 5.00	4.875– 5.00
KEROSINE		
44 w.w	4.625– 4.875	4.625– 4.875
41-43 w.w	4.50 – 4.625	4.50 – 4.625
41-43 p.w	4.50 – 4.625	4.50 – 4.625

Prices Effective	May 2	April 25
GAS AND BUNKER OILS		
For Export Shipment		
Gas Oil (b):		
Below 43 diesel index	3.25	3.50
43-47 diesel index	3.25 – 3.50	3.50
48-52 diesel index	(c)	3.625– 3.75
53-57 diesel index	3.875	3.875

(b) Less than ½ of 1% sulfur. (c) No prices reported.

For Domestic and/or Export Shipment		
Diesel Oil Ship's bkrs.	(a)$1.55	(a)$1.75
Grade C bunker oil for ship's bunkers	(a)$0.80	(a)$0.80
Grade C bunker oil, in cargoes	$0.725–$0.75	$0.75

(a) Barging 5c bbl. additional at some Gulf ports.

MID-CONTINENT LUBRICATING OILS

(Cents per gal. at Gulf; in bbls., f.a.s.; in bulk, f.o.b. terminals)

	May 2	
190-200 vis. D 210 brt	(b)Barrels	Bulk
stock	23.50 –24.50	18.00 –20.50
150-160 vis. D 210 brt. stock:		
0-10 p.p.	19.50 –20.50	14.50 –15.00
10-25 p.p.	19.00 –20.00	14.00 –14.50
150-160 vis. E 210 brt. stock	19.00 –20.00	14.00 –14.50
120 vis. D 210 brt. stock:	19.00 –20.00	14.00 –14.50

(b)Second hand barrels

	May 2	April 25
180 vis. No. 3 color neutral:	Bulk	Bulk
0-10 p.p.	8.25 –10.00	8.25 –10.00
15-30 p.p.	8.00 – 9.25	8.00 – 9.25
200 vis. No. 3 color neutral:		
0-10 p.p.	8.75 –10.50	8.75 –10.50
15-30 p.p.	8.50 –10.25	8.50 –10.25
600 s.r. olive green	9.00 –11.25	9.00 –11.25
600 s.r. dark green	7.00 – 9.25	7.00 – 9.25

SOUTH TEXAS LUBRICATING OILS

(Vis. at 100° cold test 0, bulk export shipment, f.o.b. terminals.)

Unfiltered Pale Oils: Vis. Color		
100 No. 3	4.75 – 5.25	4.75 – 5.25
200 No. 3	6.50 – 7.00	6.50 – 7.00
300 No. 3	7.00 – 7.50	7.00 – 7.50
500 No. 3½	8.00 – 8.50	8.00 – 8.50
750 No. 4	8.50 – 9.00	8.50 – 9.00
1200 No. 4	9.00 – 9.50	9.00 – 9.50
2000 No. 4	9.25 – 9.75	9.25 – 9.75
Red Oils: Vis. Color		
100 No. 5-6	4.75 – 5.25	4.75 – 5.25
200 No. 5-6	6.50 – 7.00	6.50 – 7.00
300 No. 5-6	7.00 – 7.50	7.00 – 7.50
500 No. 5-6	8.00 – 8.50	8.00 – 8.50
750 No. 5-6	8.50 – 9.00	8.50 – 9.00
1200 No. 5-6	9.00 – 9.50	9.00 – 9.50
2000 No. 5-6	9.25 – 9.75	9.25 – 9.75

Note: Red oil prices shown above cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

Tanker Rates

(Approximate freight rates to Continental ports, shillings per ton of 2240 lbs., British sterling; to U. S. ports cents per bbl.)

Rates Effective May 2

	Crude &/or Fuel		Refined Oil &/or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Gulf-U.K./Cont.(b)	17/6	16/-17/	16/	16/6-17/6
Aruba-U.K./Cont.(b)	13/	14/-15/	16/6	15/-16/
Gulf-N. Atlantic (c) (not E.of N.Y.): Hvy. Crude & fuel, (10 to 19.9 gravity)	16c	16c-17c	....	....
Light Crude, (30 Grav. or Lighter)	15c	14c-15c	....	....
Gasoline	....	....	16c	16c-17c
Kerosine	....	....	16c	16c-17c
Light Fuel	....	....	16c	16c-17c

(a) Nominal.
(b) Continental ports in range between Bordeaux and Hamburg, both inclusive.
(c) Venezuela loading same rate: Tampico 2c to 3c per bbl. additional.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency

(Effective March 7, 1938, except Corning Sept. 2, 1937)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$1.71
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$1.65
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.).....$1.55
Corning Oil in Buckeye Pipe Lines (Ohio)...$1.27

Posted by Other Companies

Tide Water Associated Oil Co.
Bradford-Allegany district (Penna. and N. Y.) (Effective March 7, 1938).....$2.05
*The Pennzoil Co.: (Effective March 7, 1938)
Penna. Grade Oil in National Transit Lines*$1.98
Ashland Oil & Transportation Co.:
Somerset Oil in Ashland Lines (Ky.):
(Effective Jan. 28, 1937)
Big Sandy River.....$1.42
Kentucky River.....$1.50

*The Pennzoil Co. posts $1.98 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other lower districts range down to $1.93 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.

Midland, Midland County (Jan. 5, 1938)....$1.12

Posted by Simrall Pipe Line Corp.

(Effective Dec. 29, 1937)

West Branch, Arenac, and equal grades.....$0.80

(Effective Jan. 8, 1938)

Beaverton, Crystal, Greendale, Porter and equal grades.....$1.12
Buckeye, Bentley, Billings, Tobacco and equal grades.....$1.095

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

(Effective Jan. 28, 1937)

Illinois, Princeton.....$1.35
Owensboro (Western Ky.).....$1.40

(Effective Nov. 20, 1937)

Lima, O.....$1.00

Posted by Stoll Oil Refining Co.

(Effective Feb. 1, 1937)

Stoll Pipe Line Oil (Ky.).....$1.40

CANADIAN FIELDS

Posted by Imperial Oil Limited
Western Ontario

(Effective Sept. 9, 1933)

Petrolia.....$2.10
Oil Springs.....$2.17

Alberta—Turner Valley

(Prices f.o.b. field tankage)

(Effective Jan. 5, 1938)

Crude Oil

40-40.9°.....	$1.14	53-53.9.....	$1.40
41-41.9.....	1.16	54-54.9.....	1.42
42-42.9.....	1.18	55-55.9.....	1.44
43-43.9.....	1.20	56-56.9.....	1.46
44-44.9.....	1.22	57-57.9.....	1.48
45-45.9.....	1.24	58-58.9.....	1.50
46-46.9.....	1.26	59-59.9.....	1.52
47-47.9.....	1.28	60-60.9.....	1.54
48-48.9.....	1.30	61-61.9.....	1.56
49-49.9.....	1.32	62-62.9.....	1.58
50-50.9.....	1.34	63-63.9.....	1.60
51-51.9.....	1.36	64-64.9.....	1.62
52-52.9.....	1.38		

Crude Naphtha, 65 grav. & above.....$2.14

Absorption Gasoline

90% Rec., 20 lb. Reid v.p.....$1.94
90% Rec., 17 lb. Reid v.p.....$2.08

MID-CONTINENT

Posted by Stanolind Crude Oil Purchasing Co., Jan. 28, 1937

	(In Oklahoma-Kansas)	(In North-North Central Texas)
Below 29.....	$1.06	$0.96
29-29.9.....	1.08	0.98
30-30.9.....	1.10	1.00
31-31.9.....	1.12	1.02
32-32.9.....	1.14	1.04
33-33.9.....	1.16	1.06
34-34.9.....	1.18	1.08
35-35.9.....	1.20	1.10
36-36.9.....	1.22	1.12
37-37.9.....	1.24	1.14
38-38.9.....	1.26	1.16
39-39.9.....	1.28	1.18
40 & above....	1.30	1.20

Above Stanolind prices met as follows:

Jan. 28, Continental Oil Co. met in Okla., Kans., and North Texas. Sinclair-Prairie met in North Texas and North Central Texas, Jan. 28, Stanolind's North Texas schedule. Same date, The Texas Co. met in North-North Central Texas.

Note: Stanolind prices in Okla.-Kans. are for quantities computed by 97% tank tables. In Texas, 100% tank tables are used effective Oct. 1, 1937, volume corrected to 60° F., and deduction for full b.s. & w. content.

*Effective Aug. 1, 1937, for Otis-Albert pools Rush-Barton counties, Kans., 13c less.

Posted by Carter Oil Co.
In Oklahoma

(Effective Jan. 28, 1937)

Below 25.....	$0.98	33-33.9.....	$1.16
25-25.9.....	1.00	34-34.9.....	1.18
26-26.9.....	1.02	35-35.9.....	1.20
27-27.9.....	1.04	36-36.9.....	1.22
28-28.9.....	1.06	37-37.9.....	1.24
29-29.9.....	1.08	38-38.9.....	1.26
30-30.9.....	1.10	39-39.9.....	1.28
31-31.9.....	1.12	40 and above...	1.30
32-32.9.....	1.14		

Above Carter schedule met Jan. 28 by the following companies: Sinclair-Prairie, Shell and Bransdall in Oklahoma-Kansas; Skelly Oil in Kansas; Tide Water in Oklahoma; Pure Oil in Oklahoma-Kansas, beginning with below 24 at $0.98 and ending with 40 & above at $1.30.

Posted by Magnolia Petroleum Co.

(Effective Jan. 28, 1937)

In Oklahoma, same schedule as Carter Oil, which see above, beginning with below 25, at $0.98 and ending with 40 & above, at $1.30.

In Texas: North and North Central, including Burkburnett, Archer, Henrietta, Electra, Comanche and Olden, same gravity and price schedule as Stanolind in North Texas, which see under Stanolind, beginning with below 29 at $0.96 and ending with 40 and above, at $1.20.

Beaumont, Tex.

(Effective Oct. 1, 1937)

Below 21°.....	$0.95	27-27.9.....	$1.15
21-21.9.....	0.98	28-28.9.....	1.17
22-22.9.....	1.01	29-29.9.....	1.19
23-23.9.....	1.04	30-30.9.....	1.21
24-24.9.....	1.07	31-31.9.....	1.23
25-25.9.....	1.10	32-32.9.....	1.25
26-26.9.....	1.13	33-33.9.....	1.27
		34 & above.....	1.29

TEXAS FIELDS

Posted by Humble Oil & Refining Co.
(**West Central Texas*)

(Effective Jan. 28, 1937)

Below 29.....	$0.96	35-35.9.....	$1.10
29-29.9.....	0.98	36-36.9.....	1.12
30-30.9.....	1.00	37-37.9.....	1.14
31-31.9.....	1.02	38-38.9.....	1.16
32-32.9.....	1.04	39-39.9.....	1.18
33-33.9.....	1.06	40 and above...	1.20
34-34.9.....	1.08		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young counties.

Shell Petroleum Corp., effective Jan. 28, posts Humble's above schedule on Fisher county crude, plus these five lower grades, beginning with below 25 gravity at $0.88; 25-25.9, $0.90; 26-26.9, $0.92; 27-27.9, $0.94, and 28-28.9, $0.96; rest of schedule same as Humble's in West Central Texas.

Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60F.

East Central Texas

(Effective Jan. 28, 1937)

Below 29.....	$1.03	35-35.9.....	$1.17
29-29.9.....	1.05	36-36.9.....	1.19
30-30.9.....	1.07	37-37.9.....	1.21
31-31.9.....	1.09	38-38.9.....	1.23
32-32.9.....	1.11	39-39.9.....	1.25
33-33.9.....	1.13	40 and above...	1.27
34-34.9.....	1.15		

*Including Anderson, Cherokee, Limestone, Navarro counties.

Same date, Sinclair-Prairie met in Mexia Humble's above schedule.

PANHANDLE TEXAS

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

	Gray County	Carson-Hutchinson
Below 35.....	$0.96	$0.91
35-35.9.....	0.98	0.93
36-36.9.....	1.00	0.95
37-37.9.....	1.02	0.97
38-38.9.....	1.04	0.99
39-39.9.....	1.06	1.01
40 & above.....	1.08	1.03

Jan. 28, above prices met by Sinclair-Prairie and Magnolia in the entire area and by Continental in Carson-Hutchinson and by Texas Co. in Panhandle Sweet, same as Humble's Gray Co. and on Panhandle Sour, same as Carson-Hutchinson.

EAST TEXAS

(Effective May 22, 1937)

Stanolind, Humble, Shell, Sinclair-Prairie, Texas Co., and Magnolia.....$1.35

Shell also posted on Jan. 28, in Livingston area, Polk County, Texas, $1.27.

NORTHEAST TEXAS

(Posted by Humble, Jan. 28, 1937)

Talco.....$0.73

(Posted by Magnolia, Jan. 28, 1937)

Cass County and Panola County, Tex.:

Same gravity and price schedule as S. O. Louisiana posts for Rodessa, La., which see under that company.

(Posted by The Texas Co., Jan. 28, 1937)

Cass County.....$1.25

WEST TEXAS AND NEW MEXICO

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

(Including Andrews, Crane, Crockett, Ector, Glasscock, Howard, Winkler and Upton Counties, Texas and Lea county, New Mexico).

Below 26.....	$0.78	33-33.9.....	$0.94
26-26.9.....	0.80	34-34.9.....	0.96
27-27.9.....	0.82	35-35.9.....	0.98
28-28.9.....	0.84	36-36.9.....	1.00
29-29.9.....	0.86	37-37.9.....	1.02
30-30.9.....	0.88	38-38.9.....	1.04
31-31.9.....	0.90	39-39.9.....	1.06
32-32.9.....	0.92	40 & above....	1.08
Pecos, West Texas.....			$0.91

Jan. 28, Magnolia met Humble in Crane, Upton, Howard, Glasscock, Mitchell and Winkler.

Shell Petroleum Corp., on Jan. 28, met Humble in Crane, Glasscock, Howard, Pecos (except Yates shallow pool), Winkler, and Upton counties, Tex., and in Lea County, N. Mex. On Jan. 28, Shell posted in Yates shallow pool in Pecos county, Tex., $0.81. June 4, 1937, Shell added Ector county to West Texas postings.

Jan. 28, Stanolind Oil & Gas Co. met Humble in Hendrick field, Winkler county.

Jan. 28, Texas Co. met Humble in Ward and Winkler counties, Tex., and Lea County, N. M. except that its top grade is 36 and above, at $1.00.

April 20, 1937, Sinclair Prairie met Humble in Ward and Winkler, Tex. and Lea, N. M., counties, except that its gravity schedule ends with 36 and above, at $1.00.

Posted by Continental Oil Co.

(Effective Jan. 28, 1937)

Artesia, Jackson and Maljamar pools, N. M...$0.90

COLORADO

(Posted by Continental Oil Co., Effective Jan. 28, 1937)

Ft. Collins and Wellington

Below 29.....	$1.01	35-35.9.....	$1.15
29-29.9.....	1.03	36-36.9.....	1.17
30-30.9.....	1.05	37-37.9.....	1.19
31-31.9.....	1.07	38-38.9.....	1.21
32-32.9.....	1.09	39-39.9.....	1.23
33-33.9.....	1.11	40 & above.....	1.25
34-34.9.....	1.13		

Cannon City and Florence, Col.....$1.10

SOUTH AND SOUTHWEST TEXAS

All Shown Below Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoborouski fields.....$1.09
Pettus.....$1.37 Van Zandt.....$1.10

Jan. 28, Magnolia met Humble in Darst Creek; posted $1.00 in Luling; $1.12 in Lytton Springs; $1.27 for Cleveland, and $1.15 in Hardin, both in Liberty county, Tex.

Jan. 28, 1937, The Texas Co. met Humble in Darst Creek.

Anahuac, Dickinson, Flour Bluff and Turtlebay

(Effective Jan. 28, 1937)

Below 31.....	$1.16	36-36.9.....	$1.28
31-31.9.....	1.18	37-37.9.....	1.30
32-32.9.....	1.20	38-38.9.....	1.32
33-33.9.....	1.22	39-39.9.....	1.34
34-34.9.....	1.24	40 and above....	1.36
35-35.9.....	1.26		

Conroe, Raccoon Bend (Deep sand crude) Tomball and Satsuma

(Effective Jan. 28, 1937)

Below 29.....	$1.20	35-35.9.....	$1.34
29-29.9.....	1.22	36-36.9.....	1.36
30-30.9.....	1.24	37-37.9.....	1.38
31-31.9.....	1.26	38-38.9.....	1.40
32-32.9.....	1.28	39-39.9.....	1.42
33-33.9.....	1.30	40 & above.....	1.44
34-34.9.....	1.32		

Jan. 28, Magnolia met Humble in Tomball and Texas Co. met Humble in Conroe, beginning with 35-35.9 gravity.

(*Continued on next page*)

CRUDE OIL MARKETS

(Continued from preceding page)

South-Southwest Texas (cont'd)

Posted by Humble

***Mirando**

(Effective July 6, 1937)

Below 21	$0.96	31-31.9	$1.18
21-21.9	0.98	32-32.9	1.20
22-22.9	1.00	33-33.9	1.22
23-23.9	1.02	34-34.9	1.24
24-24.9	1.04	35-35.9	1.26
25-25.9	1.06	36-36.9	1.28
26-26.9	1.08	37-37.9	1.30
27-27.9	1.10	38-38.9	1.32
28-28.9	1.12	39-39.9	1.34
29-29.9	1.14	40 & above	1.36
30-30.9	1.16		

*Includes Duval, Jim Hogg, Webb and Zapata counties, Tex. and Heyser and Placedo crudes.

July 6, Magnolia posted same schedule as Humble in Mirando.

July 6, 1937, Texas Co. posted for Duval-Mirando, $0.96 for below 21, plus 2c differential, to $1.12 for 28 & above.

LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana

	*N. La.-Ark.	Rodessa, La.	So. La. Roanoke N. Crowley
	(Effective Jan. 28, 1937)		(Dec. 28,'37)
Below 21°	$0.90	$0.93	$0.90
21-21.9	for	for	.93
22-22.9	oil	oil	.96
23-23.9	Below	Below	.99
24-24.9	25°.	25°.	1.02
25-25.9	$0.92	$0.95	1.05
26-26.9	.94	.97	1.08
27-27.9	.96	.99	1.10
28-28.9	.98	1.01	1.12
29-29.9	1.00	1.03	1.14
30-30.9	1.02	1.05	1.16
31-31.9	1.04	1.07	1.18
32-32.9	1.06	1.09	1.20
33-33.9	1.08	1.11	1.22
34-34.9	1.10	1.13	1.24
35-35.9	1.12	1.15	1.26
36-36.9	1.14	1.17	1.28
37-37.9	1.16	1.19	1.30
38-38.9	1.18	1.21	1.32
39-39.9	1.20	1.23	1.34
40 & above	1.22	1.25	1.36

*Includes Caddo, Homer, Haynesville, Sabine, De Soto, Sarepta, Carterville, El Dorado, Bunkie and Miller county.

Smackover, Ark. $0.90

Urania, La. (Arkansas Fuel Oil Co., Jan. 28, '37) $1.02

Tepetate, La. (Continental Oil, Jan. 28, '37) ... 1.24

Jan. 28, 1937, Magnolia met S. O. La.'s No. La.-Ark. gravity and price schedule in Pine Island, Haynesville, Bull Bayou and Cotton Valley, La., and in Eldorado and Rainbow districts, Ark.; and met S. O. La.'s Rodessa prices; and in Lockport, Iowa, Cameron Meadow, La., posted Humble's gravity and price schedule on Mirando. El Dorado East Field, Ark. price same as Smackover, effective Jan. 28, '37.

Jan. 28, The Texas Co. met S. O. La. in N. La., except that its gravity schedule begins with below 27 at $0.94. It posted $1.37 for Garden Island, La., $1.24 for LaFitte, La. and $0.90 for Smackover.

***GULF COASTAL FIELDS**

Posted by Humble Oil & Refining Co. and The Texas Co.

	Humble	Texas	Saxet (Humble)
	(Effective Jan. 28, 1937)		(July 6 '37)
Below 18	$0.95	‡$0.95	....
18-18.9	for	for	....
19-19.9	below	below	....
20-20.9	21°	21°.	$1.01
21-21.9	0.98	0.98	1.03
22-22.9	1.01	1.01	1.05
23-23.9	1.04	1.04	1.07
24-24.9	1.07	1.07	1.09
25-25.9	1.10	1.10	1.11
26-26.9	1.13	1.13	1.13
27-27.9	1.15	1.15	1.15
28-28.9	1.17	1.17	1.17
29-29.9	1.19	1.19	1.19
30-30.9	1.21	1.21	1.21
31-31.9	1.23	1.23	1.23
32-32.9	1.25	1.25	1.25
33-33.9	1.27	1.27	1.27
34-34.9	1.29	1.29	1.29
35-35.9	1.31	for	1.31
36-36.9	1.33	oil	1.33
37-37.9	1.35	34°	1.35
38-38.9	1.37	and	1.37
39-39.9	1.39	above.	1.39
40 and above	1.41	....	1.41

†Refugio

(Effective July 6, 1937)

Posted by Humble

20-20.9	$1.01	23-23.9	$1.07
21-21.9	1.03	24-24.9	1.09
22-22.9	1.05	25-25.9	1.11

Rest of schedule same as Humble's Gulf Coastal crude prices.

†Includes Saxet, Greta, O'Connor-McFadden, Taft, Plymouth and Tom O'Connor crude.

*Humble's prices apply in these Texas fields: Amelia, Barbers Hill, Goose Creek, Hull, Liberty, Mykawa, Orange, Pierce Junction, Raccoon Bend, (shallow sand), Sugarland, Thompsons, and West Columbia. Same prices also apply, effective Feb. 1, 1938, in Clinton, Tex., posted by Stanolind Crude Oil Purch. Co.

Jan. 28, Sinclair-Prairie met above Humble schedule in full.

‡$0.95 for oil below 21° posted April 1, 1938.

July 6, 1937, The Texas Co. posted for Refugio, which includes Greta, Saxet and Taft: $1.01 for below 21, plus 2c differential, to $1.17 for 28 & above.

Texas Co. postings in Gulf Coastal Texas include: Arriola, Five Corners, Ganado, Humble, Liberty, Magnet, Manvel, Markham, Mauritz, McFaddin, Pickett Ridge, Port Neches, Sour Lake, West Columbia and Withers. In Gulf Coastal Louisiana: Bay St. Elaine, Caillou Island, Dog Lake, Four Isle, Gillis, Horseshoe Bayou, Iberia, Lake Barre, Lake Pelto, Leesville and Port Barre.

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.

(Effective Jan. 28, 1937)

Salt Creek, (except Tensleep crude), Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma, Kansas which see under Mid-Continent crude on previous page.

(Effective Jan. 6, 1938)

Tensleep, Salt Creek field $0.70

(Effective Jan. 28, 1937)

Greybull-Torchlight	$1.30
Iles, light, Col.	1.18
Iles, heavy	1.12
Hogback, N. M.	1.33
Big Muddy	1.23
Elk Basin, light	1.30
Grass Creek, light	1.30
Frannie light	0.82

(Effective Nov. 4, 1936)

Grass Creek, heavy	$0.62
Frannie heavy	0.62
Hamilton Dome, Wyo.	0.57

Posted by Ohio Oil Co.

(Effective Jan. 28, 1937)

Elk Basin, Wyo.	$1.30
Grass Creek, light	1.30
Rock Creek	1.205
Lance Creek	0.97

(Effective Nov. 16, 1937)

Sunburst, Mont.	$0.90

Posted by Continental Oil Co.

(Effective Jan. 1, 1938)

Cat Creek, Mont.	$1.30

(Effective Jan. 28, 1937)

Big Muddy, Wyo.	1.18
Lance Creek, Wyo.	0.97

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 26, 1936, except Huntington Beach, Playa del Rey, Santa Fe Springs, Kern Front, Signal Hill (Long Beach) effective March 7, 1936; Elk Hills effective June 22, 1936; Lakeview Area, Aug. 19, 1936; El Segundo and Wilmington, Oct. 15, 1937; Greeley-Canal, Dec. 22, 1937.

Gravity	Signal Hill (Long Beach) El Segundo †Wilmington	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda Brea Canon	Athens Rosecrans	Dominguez	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	‡Newhall and others	Mountain View	Elk Hills	Buena Vista Hills Midway-Sunset Lakeview Area	Greeley-Canal (Kern County)	Lost Hills	Coalinga	Wheeler Ridge
14-14.9	$0.80	0.79	0.74	0.78	0.79	0.80	0.76	....	....	0.80	0.76	0.76	0.77	0.78	....	0.70	....	0.70	0.70	.....	0.70	0.70	....
15-15.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	.....	.70	.70	....
16-16.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	.....	.70	.70	....
17-17.9	.80	.79	.74	.78	.81	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	.....	.70	.70	....
18-18.9	.80	.79	.74	.78	.84	.80	.78	....	....	.82	.76	.76	.77	.78	....	.70	....	.70	.70	.....	.70	.70	....
19-19.9	.82	.79	.74	.82	.87	.84	.81	....	....	.85	.76	.78	.77	.78	....	.70	70	.74	.74	.....	.74	.71	70
20-20.9	.85	.79	.74	.85	.90	.88	.84	....	....	.88	.78	.82	.77	.80	....	....	70	.78	.78	.....	.78	.72	70
21-21.9	.88	.79	.74	.89	.93	.93	.88	....	....	.91	.80	.85	.77	.84	.78	....	73	.82	.82	.....	.82	.74	70
22-22.9	.92	.82	.74	.92	.96	.98	.92	....	....	.93	.84	.89	.79	.88	.78	....	77	.87	.87	.....	.86	.78	72
23-23.9	.95	.86	.77	.96	.99	1.02	.96	.84	.79	.96	.88	.93	.82	.92	.78	....	80	.92	.92	.....	.90	.82	76
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	.99	.91	.96	.85	.96	.82	....	.84	.97	.97	.....	.94	.86	79
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	1.02	.95	....	.89	.99	.86	....	.88	1.01	1.01	.....	.98	.90	.83
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	1.05	.98	....	.92	1.03	.90	....	.91	1.06	1.06	.....	1.02	....	....
27-27.9	1.10	1.05	.88	1.11	1.12	....	1.10	1.08	.88	....	1.02	....	.96	1.06	.95	....	.95	1.10	1.10	$0.84	1.06	....	....
28-28.9	1.14	1.10	.90	1.14	1.15	....	1.14	1.07	90	....	1.06	....	99	1.10	.99	....	.99	1.15	1.15	88	1.10	....	....
29-29.9	1.17	1.15	.93	1.18	1.18	....	1.17	1.12	93	....	1.09	....	1.03	1.14	1.03	....	1.02	1.20	1.20	92	1.14	....	....
30-30.9	1.21	1.19	.95	1.22	1.21	....	1.21	1.17	.95	....	....	....	1.07	1.17	1.08	....	1.06	1.25	1.25	95	1.18	....	....
31-31.9					1.24		1.24	1.22	.97	....	....	....	1.11	1.21	1.12	....	1.09	1.29	1.29	99			
32-32.9	*Elwood Terrace			....	1.27		1.27	1.27	1.00	....	....	....	1.14	1.25	1.16	....	1.13	1.34	1.34	1.03	Kettleman Hills		
33-33.9	....	1.28	....	....	....		....	1.32	....	....	....	....	1.18	1.28	1.20	....	1.17	1.38	1.38	1.07	....	1.19	....
34-34.9	....	1.32	....	....	....		....	1.37	....	....	....	....	1.22	1.32	1.25	....	1.20	....	....	1.11	....	1.23	....
35-35.9	....	1.35	....	....	....		....	1.42	....	....	....	....	1.25	....	1.29	....	....	....	....	1.15	....	1.27	....
36-36.9	....	1.39	....	....	....		....	1.46	....	....	....	....	1.29	....	1.33	....	....	....	....	1.19	....	1.31	....
37-37.9	....	1.43	....	....	....		....	1.51	....	....	....	....	1.32	....	1.37	....	....	....	....	1.23	....	1.35	....
38-38.9	....	....	....	....	....		....	1.56	....	....	....	....	1.36	....	1.42	....	....	....	....	1.27	....	1.39	....
39-39.9	....	....	....	....	....	F. O. B. Standard Pipe Line	....	1.61	....	....	....	....	1.40	....	....	....	....	....	....	1.31	....	1.43	....
40-40.9	....	....	....	....	....		....	1.66	....	....	....	....	1.43	....	....	....	....	....	....	1.34	....	....	....
41-41.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.38	....	....	....
42-42.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.41	....	....	....
43-43.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.45	....	....	....
44-44.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.49	....	....	....
45-45.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.53	....	....	....
46-46.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.56	....	....	....
47-47.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.60	....	....	....
48-48.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.64	....	....	....

*F. o. b. ship

‡Also McKittrick, Kern River. Kern Front and Round Mountain $0.70 thru 19.9 gravity; no higher gravity quoted.

†Wilmington prices differ on gravities below 18.9. Prices are: 14-16.9, $0.75; 17-17.9, $0.77; and 18-18.9, $0.79; rest of schedule same as Signal Hill.

CLASSIFIED

Positions Wanted

AVAILABLE NOW, man 39, with 20 years oil accounting. Executive capacity. Also burner experience. Reasonable. Go anywhere. Address Box 112, National Petroleum News, 59 East Van Buren St., Chicago.

PIPELINE OR REFINERY DIVISION—14 years office experience—7 years secretary and chief clerk respectively—4 years chief clerk and office manager—5 years general office experience. High school and university training. Familiar all office routine and management. Available immediately. Address Box 518, National Petroleum News.

Situations Open

CHEMIST—experienced in analyzing greases and familiar with grease production control methods—or grease maker with chemical experience—wanted for laboratory near New York City. Previous connection with grease manufacturers essential. State qualifications, references, etc. Address Box 519, National Petroleum News.

Equipment Wanted

WANTED TO PURCHASE—One (1) 2000 gal. truck tank, (Used); One (1) 2500 gal. used tank; One (1) 3000 gal. used tank; or used trucks complete with tank. Give complete details, year, make, size compartments, etc. (Within 300 miles, New York City).
AMERICAN PETROLEUM CO.
Little Ferry, N. J.

Business Opportunities

CUBA—The new oil field of the world with a new oil law favoring exploitation offers opportunities now. As an attorney I have several attractive propositions in oil rights, which will be worth your while investigating. These fields are being opened up now. Write or cable Dr. J. A. Echevarria. —57 Habana St., Havana, Cuba.

SALE AND PURCHASE
of
GASOLINE-and-OIL COMPANIES
BULK PLANTS and
JOBBING CONCERNS
Confidentially Negotiated
WM. WISHAR
Broker of Oil Marketing Properties
2331 Grandview, Cleveland Heights, O.

Professional Services

HUNTLEY & HUNTLEY
Petroleum Geologists and Engineers
L. G. Huntley J. R. Wylie, Jr.
H. Rutherford, *Geophysics*
Grant Building Pittsburgh, Pa.

ANTI-KNOCK VALUES
DETERMINATIONS
The Gray Industrial Laboratories
Chemists and Engineers
Specialists on Petroleum Products
961-976 Frelinghuysen Ave.,
NEWARK, N. J.
Telephone Bigelow 3-4020

GEORGE A. BURRELL
Petroleum and Gas Engineer
Design Construction Reports
Suite 2900,
50 Broadway 1936-42 Fifth Ave.
New York City Pittsburgh, Pa.

PHOENIX
CHEMICAL LABORATORY
An Exclusive Petroleum Testing Laboratory
Equipped For All Known Tests & Research in Petroleum Products
3953 Castello Ave., Chicago
Telephone—Spalding 3578

Index to Advertisers

This index is published as a convenience to the reader. Every care is taken to make it accurate, but National Petroleum News assumes no responsibility for errors or omissions.

Acheson Colloids Corp. .....
Alemite 37
Aluminum Co. of America .....
American Mineral Spirits Co. .....
American Telephone & Telegraph Co. .....
Anderson-Prichard Oil Co. 2

Bakelite Corp. .....
Battenfeld Grease & Oil Corp. 31
Berry Sons' Co., James B. 51
Blackmer Rotary Pump Co. .....
Bowser & Co., Inc., S. F. .....
Bradford Oil Refg. Co. .....
Brodie Co., Inc., Ralph N. .....
Brookins Manufacturing Co. .....
Buckeye Iron & Brass Works .....
Butler Manufacturing Co. .....

Canfield Oil Co. .....
Champion Spark Plug Co. 4
Champlin Refg. Co. .....
Chevrolet Motor Division, General Motors Sales Corp. .....
Chicago Bridge & Iron Co. .....
Cincinnati Ball Crank Co. .....
Cincinnati Mfg. Co. .....
Cities Service Oil Co. .....
Columbian Steel Tank Co. .....
Conewango Refg. Co. 44
Curtis Pneumatic Machinery Co.... 40
Cushing Refg. & Gasoline Co. .....

Davis Welding & Mfg. Co. .....
Deep Rock Oil Corp. .....
du Pont de Nemours & Co., E. I...
Durakool, Inc. .....

Edwards & Co., Vincent 51
Electric Hose & Rubber Co. .....
Electric Storage Battery Co. .....
Erie Meter Systems, Inc. ..Third Cover
Ethyl Gasoline Corp. .....
Exide Batteries .....

Fairbanks-Morse & Co. .....
Farrell Mfg. Co. .....
Ford Motor Co. .....
Freedom Oil Works Co. 49
Fruehauf Trailer Co. .....

General American Transportation Corp. 6
General Electric Co. .....
Goodall Rubber Co. .....
Goodrich Rubber Co., B. F. .....
Goodyear Tire & Rubber Co. 3
Graver Tank & Mfg. Co., Inc. .....
Gulf Oil Corp. .....

Hays Mfg. Co. .....
Heekin Can Co. .....
Hinde & Dauch Paper Co. .....
Humble Oil & Refining Co. .....

Industrial Oil Corp. .....
International Harvester Co. .....
International Petroleum Exposition 5

Johnson Co., S. T. .....
Johnston & Jennings Co. .....

Kidde & Co., Inc., Walter .....

Leland Electric Co. .....

McDonald Mfg. Co., A. Y. .....
Manhattan Rubber Mfg. Divn. of Raybestos-Manhattan, Inc. .....
Master Electric Co. .....
Metal Hose & Tubing Co. .....
Mid-Continent Petroleum Corp.....
Miller Tires .....
Morrison Bros. .....Second Cover

National Pumps Corp. .....
Neptune Meter Co. .....
New York Lubricating Oil Co. .....

Ohio Oil Co. 55
Oil Equipment Mfg. Co. .....

Paraflow .....
Peerless Electric Co. 51
Pennsylvania Grade Crude Oil Assn.
Pennsylvania Petroleum Products Co. 40
Penola, Inc. .....
Philadelphia Valve Co. .....
Phillips Petroleum Co. 43
Pittsburgh Equitable Meter Co. ... 1
Pittsburgh Plate Glass Co. .....
Pure Oil Co. .....
Pyroil Co. .....

Republic Oil Co. .....
Roper Corp., Geo. D. .....
Rumex Oil Products Ltd. 49

Service Station Equipment Co. 29
Shand & Jurs Co. .....
Shell .....
Skelly Oil Co. .....
Smith Meter Co. .....
Southwest Pump Co. .....
Standard Oil Co. of N. J. .....
Standard Steel Works .....
Stevens Hotel .....
Stewart-Warner Corp. .....
Sun Oil Co. ..... Fourth Cover

Texaco Development Corp. .....
Thiokol Corp. .....
Tokheim Oil Tank & Pump Co....

U. S. Air Compressor Co. 7
U. S. Rubber Products Co., Inc.....
U. S. Steel Corp. .....
Universal Oil Products Co. 27

Viking Pump Co. .....

Wayne Pump Co. .....
Wheeling Corrugating Co. 35
Wiloil Corp. .....

Coming Meetings

American Gas Assn., Natural Gas Dept., annual convention, New Orleans, La., May 9 to 12.

Natural Gasoline Assn., of America, 17th annual convention, Hotel Tulsa, Tulsa, May 11 to 13.

National Oil Scouts Assn. of America, Tulsa, Okla., May 12, 13 and 14.

International Petroleum Exposition, Tulsa, Okla., May 14 and 21.

Virginia Oil Men's Assn., annual meeting, John Marshall Hotel, Richmond, Va., May 20.

American Petroleum Institute, mid-year meeting, Allis and Lassen Hotels, Wichita, Kans., May 23, 24 and 25.

7th Annual Petroleum and Natural Gas Conference, Penna. State College, Penna. Grade Crude Oil Assn., and Penna. Natural Gas Men's Assn., State College, Pa., May 27, 28.

Society of Automotive Engineers, summer meeting, The Greenbrier, White Sulphur Springs, W. Va., June 12 to 17.

Oil Trades Assn. of New York, sports day, Pelham Country Club, Pelham, N. Y., June 14.

American Society of Mechanical Engineers, national oil and gas power meeting, Dallas, Texas, June 15 to 18.

Pennsylvania Grade Crude Oil Assn., William Penn Hotel, Pittsburgh, Pa., June 16, 17 and 18.

American Society of Mechanical Engineers, St. Louis, Mo., June 20 to 24.

American Society for Testing Materials, annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., June 27 to July 1.

West Virginia Oil and Natural Gas Assn., Charleston, W. Va., July 27, 28.

American Chemical Society, Milwaukee, Wis., Sept. 5 to 9.

National Petroleum Assn., 36th annual meeting, Hotel Traymore, Atlantic City, Sept. 14, 15 and 16.

Oil Trades Assn. of New York, sports day, Pelham Country Club, Pelham, N. Y., Sept. 20.

National Association of Petroleum Retailers, annual meeting, St. Louis, Sept. 27, 28 and 29.

Society of Automotive Engineers, national regional fuels and lubricants meeting, Tulsa, Okla., Oct. 6 and 7.

National Automobile Show, Grand Central Palace, New York, Nov. 11 to 18.

Society of Automotive Engineers, annual dinner, Commodore Hotel, New York, N. Y., Nov. 14.

American Petroleum Institute, 19th annual meeting, Stevens Hotel, Chicago, Ill. Nov. 14 to 18.

American Society of Mechanical Engineers, Philadelphia, Pa., Dec. 4 to 9.

Exposition of Chemical Industries, Grand Central Palace, New York, Dec. 4 to 9.

Nebraska Petroleum Marketers, Inc., Omaha, Nebr., Dec. 6 to 8.

California Assignment

LOS ANGELES—R. W. Clark, formerly a member of the Gulf Oil Corp. geological department in Pittsburgh, will be in the Los Angeles office of Western Gulf Oil Co. for the next few months. During his absence, Wendell Gealy has been recalled from a field assignment with a seismograph party to handle Clark's duties in Pittsburgh.